

SERVICE MANUAL

MODEL
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VPH-V20M

VPH-V20U

VPH-V22M

DEST.
.....

AEP

US/CND

AEP

CHASSIS NO.
.....

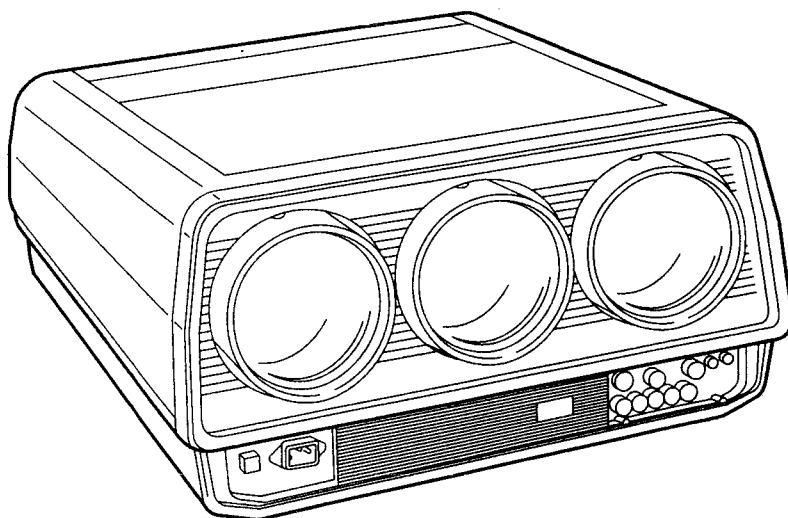
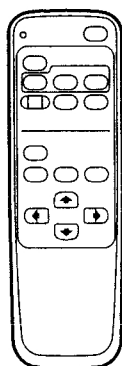
SCC-K82B-A

SCC-K81B-A

SCC-K82D-A

MODEL
.....

RM-PJV20



COLOR VIDEO PROJECTOR

SONY

⚠ WARNING

This manual is intended for qualified service personnel only.

To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

WARNING!!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD, BECAUSE OF LIVE CHASSIS. THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION.

REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

ATTENTION!!

AFIN D'EVITER TOUT RISQUE D'ELECTROCUTION PROVENANT D'UN CHÂSSIS SOUS TENSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISÉ LORS DE TOUT DÉPANNAGE.

LE CHÂSSIS DE CE RÉCEPTEUR EST DIRECTEMENT RACCORDÉ À L'ALIMENTATION SECTEUR.

ATTENTION AUX COMPOSANTS RELATIFS À LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UNE MAPQUE ⚠ SUR LES SCHÉMAS DE PRINCIPE, LES VUES EXPLOSÉES ET LES LISTES DE PIÈCES SONT D'UNE IMPORTANCE CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT. NE LES REMPLACER QUE PAR DES COMPOSANTS SONY DONT LE NUMÉRO DE PIÈCE EST INDIQUÉ DANS LE PRÉSENT MANUEL OU DANS DES SUPPLÉMENTS PUBLIÉS PAR SONY. LES RÉGLAGES DE CIRCUIT DONT L'IMPORTANCE EST CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT SONT IDENTIFIÉS DANS LE PRÉSENT MANUEL. SUIVRE CES PROCÉDURES LORS DE CHAQUE REMPLACEMENT DE COMPOSANTS CRITIQUES, OU LORSQU'UN MAUVAIS FONCTIONNEMENT EST SUSPECTÉ.

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SECTION 1 OPERATING INSTRUCTIONS

This section is extracted
from operation manual.

1-1. OPERATING INSTRUCTIONS

3-465-079-11(1)

SONY.

Color Video Projector

Operating Instructions Page 2 GB

**VPH-V20M/V20U
VPH-V22M**

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For the customers in the USA

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Für Kunden in Deutschland

Dieses Produkt kann im kommerziellen und in begrenztem Maße auch im industriellen Bereich eingesetzt werden. Es ist zu beachten, dass es in einer Einrichtung, welche die Funk-Einstörung nach Klasse B besitzt.

For the customers in the United Kingdom

WARNING

THIS APPARATUS MUST BE EARTHED

IMPORTANT

This warning is for the safety of the user. The mains lead is coloured in accordance with the following code:

Blue: Neutral
Green-and-Yellow: Earth
Brown: Live
As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:
The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol Y or coloured green or green-and-yellow.
The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black. The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

Voor de klanten in Nederland

Bij dit product zijn batterijen geleverd. Wanneer deze leeg zijn, moet u ze niet weggooien maar inleveren als KCA.



The socket-outlet should be installed near the equipment and be easily accessible.

The instructions in this manual are for the VPH-V20U (for the USA and Canada) and the VPH-V20M/VPH-V22M (for European countries). Before you start operating, please check your model and the instructions for that model.
There are no differences between these models in operation.
The differences in specifications are indicated on page 29.
The illustrations used in this manual are of the VPH-V22M.

You can change the on-screen display language if you prefer German, French, Italian or Spanish. To change the language, see page 17 or the supplement attached to this manual.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

AVERTISSEMENT

Pour prévenir tout risque d'incendie ou d'électrocution, garder cet appareil à l'abri de la pluie et de l'humidité.

Pour prévenir tout risque d'électrocution, ne pas ouvrir le boîtier. Confier l'entretien de cet appareil exclusivement à un personnel qualifié.

VORSICHT

Um Feuergefahr und die Gefahr eines elektrischen Schlags zu vermeiden, setzen Sie das Gerät weder Regen noch sonstiger Feuchtigkeit aus.

Um einen elektrischen Schlag zu vermeiden, öffnen Sie das Gehäuse nicht. Überlassen Sie Wartungsarbeiten stets nur qualifiziertem Fachpersonal.

ADVERTENCIA

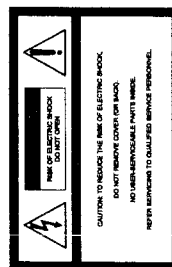
Para prevenir el riesgo de incendios o de electrocución, no exponga la unidad a la lluvia ni a la humedad.

Para evitar descargas eléctricas, no abra la unidad. En caso de avería, solicite el servicio de personal cualificado únicamente.

ATTENZIONE

Per evitare il pericolo di incendi o scosse elettriche, non esporre l'apparecchio alla pioggia o all'umidità e non aprirlo.

Per eventuali riparazioni, rivolgersi esclusivamente a personale qualificato.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Precautions

On safety

- Check that the operating voltage of your unit is identical with the voltage of your local power supply. If voltage adaptation is required, consult with qualified Sony personnel.
- Should any liquid or solid object fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it further.
- Unplug the unit from the wall outlet or set the MAIN POWER switch to OFF if it is not to be used for several days.
- To disconnect the cord, pull it out by the plug. Never pull the cord itself.
- The wall outlet should be near the unit and easily accessible.
- The unit is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet, even if the unit itself has been turned off.

On installation

- When the projector is mounted on the ceiling, the Sony PSS-722/PSS-10 projector suspension support must be used for installation. Read the installation manual of the PSS-722/PSS-10 carefully, since the ceiling should be reinforced for safety.
- Allow adequate air circulation to prevent internal heat build-up. Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation holes. Leave space of more than 30 cm (12 inches) between the wall and the projector. Be aware that room heat rises to the ceiling; check that the temperature near the installation location is not excessive.
- Do not install the unit in a location near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust or humidity, mechanical vibration or shock.
- To avoid moisture condensation, do not install the unit in a location where the temperature may rise rapidly.
- Fans are installed inside the projector to prevent internal heat build-up. The fans produce a humming noise when the power is switched on, which is normal. Should the noise sound abnormal, please consult qualified Sony personnel.

On illumination

- To obtain the best picture, the front of the screen should not be exposed to direct lighting or sunlight.
- Ceiling-mounted spot lighting is recommended. Use a cover over fluorescent lamps to avoid lowering contrast ratio.
- Cover any windows that face the screen with opaque draperies.
- It is desirable to install the projector in a room where floor and walls are not of light-reflecting material. If the floor and walls are of reflecting material, it is recommended that the carpet and wall paper be changed to a dark color.

On cleaning

- To keep the cabinet looking new, periodically clean it with a soft cloth. Stubborn stains may be removed with a cloth lightly dampened with a mild detergent solution. Never use strong solvents, such as thinner or benzene cleansers, since these will damage the cabinet.
- Avoid touching the lens. To remove dust on the lens, use a soft dry cloth. Do not use a damp cloth, detergent solution, or thinner.

On CRT burns

When a static picture of a VCR or a computer is displayed for more than about one hour, a CRT burn may result. This means that an after-image impression of the static picture remains on the screen even after the picture has changed. If it is necessary to display the same static picture for more than one hour, we recommend that you set the CONTR (contrast) control to the lowest setting.

Also, when a picture of different size is displayed beyond a certain length of time, an after-image impression of the frame of smaller picture may be burnt on the screen (such as displaying a 16:9 picture on a 4:3 screen.) To avoid this, we recommend that you use the same picture size when possible. However, if it is necessary to use a different picture size, set the CONTR (contrast) control and the BRT (brightness) control of the smaller picture to the lowest setting possible. This will minimize the risk of creating an after-image impression.

If the CRT burns, it must be replaced. In this case, refer to the warranty provided with this unit. Consult your Sony dealer or Qualified Service Personnel.

On repacking

Save the original shipping carton and packing material; they will come in handy if you ever have to ship your unit. For maximum protection, repack your unit as it was originally packed at the factory.

Features

Bright image—light output of 750 lumen

A newly developed phosphor and electron gun provide a high-quality image with extra sharpness and brightness.

Clear color reproduction—high-quality circuit

A high-quality picture is obtained by combining the use of a three-line logical comb filter to reduce dot interference and cross color, and the use of a new chroma transient circuit to improve color sharpness by removing color blur.

Component signal input

The projector is equipped with a component signal input to accept high-quality video format component signals used for TV broadcasting services including program production.

Wireless and wired remote control

You can operate your projector from a distance with the supplied remote commander. You can also use the commander as a wired commander by connecting it with a remote (stereo or monaura) control cable (not supplied) to the projector.

Illuminated remote commander and control panel

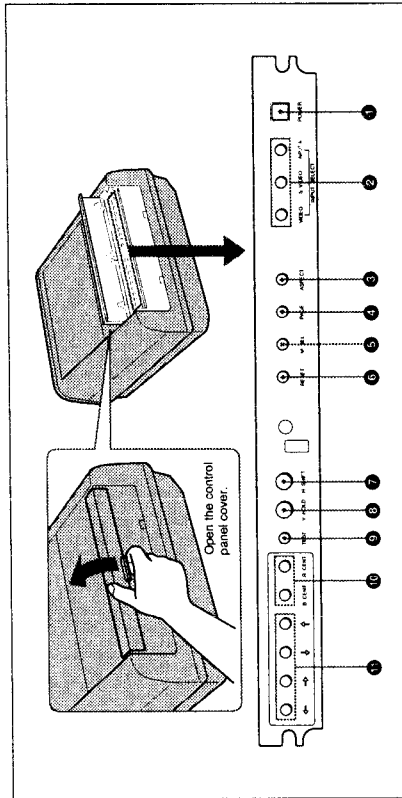
When you press the LIGHT button on the remote commander or you open the control panel cover, the key indicators are illuminated for proper operation in low light.

Other features

- Four color systems available
The PAL, SECAM, NTSC or NTSC443 color system is selected automatically.
- Various installation possibilities
The projector is designed to be installed on a desk, the floor or the ceiling and can be used with a flat screen or rear projection screen.
- Internal test signal
The centering adjustment can be performed easily by projecting the built-in cross-hair test signal. No external test signal is needed.

Location and Function of Controls

Control Panel



1 POWER switch

Press to turn the projector on and off.

2 INPUT SELECT buttons

Press to select the input signal.
VIDEO connector (BNC): to select the signal input from the VIDEO IN VIDEO connectors
S VIDEO connector (4-pin mini DIN): to select the signal input from the VIDEO IN S VIDEO connectors
INPUT A: to select the signal input from the INPUT A connectors

3 ASPECT button

Press to switch the aspect ratio between 4:3 picture and 16:9 picture.

4 PAGE button

Press to display three on-screen displays. You can check and change various control settings. Each time you press the button, the following display appears: USER PRESET, PICTURE CONTROL and SYSTEM PRESET.

5 M SEL (memory select) button

Press to select the memory position of the picture adjustment levels.

6 RESET button

Press to restore the picture adjustment levels to the standard levels. The button functions while the PICTURE CONTROL display or the adjustment level is displayed on the screen.

7 H SHIFT (horizontal shift) control

Turn to adjust the horizontal position of the RGB input picture.

8 V HOLD (vertical hold) control

If the picture rolls vertically, turn to stabilize the picture.

9 TEST button

Press to display the test pattern to check the centering of the three colors, red, green and blue. To restore the normal screen, press it again.

10 R/B CENT buttons

Press to enter the red and blue centering adjustment mode.

R CENT: to enter the red centering adjustment mode.
B CENT: to enter the blue centering adjustment mode.

To perform the centering adjustment, use the four arrow buttons.

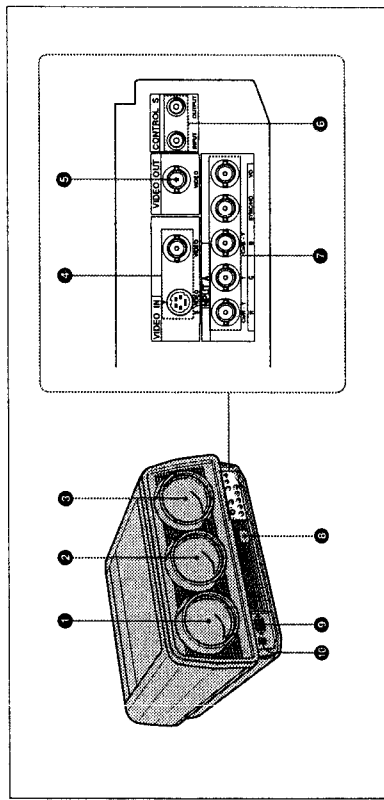
To return to the normal display, press the same button again.

11 Arrow buttons

Use these buttons for various adjustment functions.

Location and Function of Controls

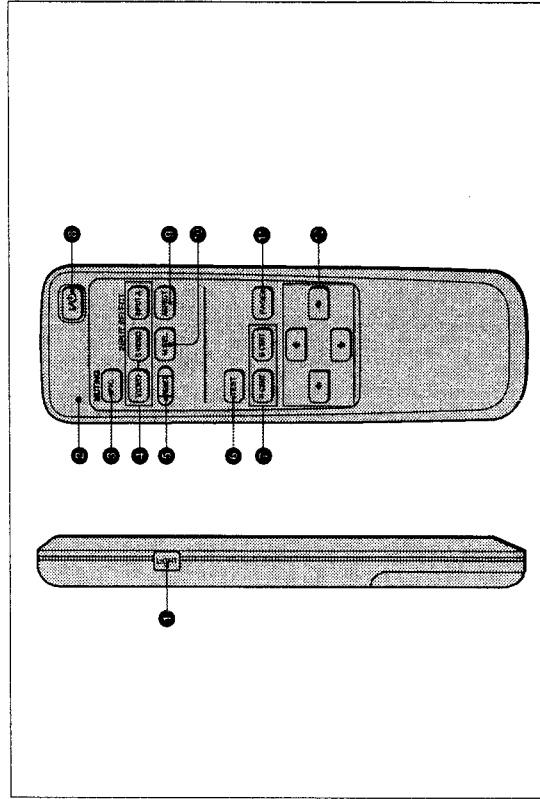
Front (Connector Panel)



- 1 Red lens**
- 2 Green lens**
- 3 Blue lens**
- 4 VIDEO IN connectors**
S VIDEO connector (4-pin mini DIN): Connect to the S video output of a VCR.
VIDEO connector (BNC): Connect to the video output of a VCR.
- 5 VIDEO OUT connector (BNC)**
Connect to the video input of a color monitor.
- 6 CONTROL S jacks**
INPUT (stereo minijack): Connect to the CONTROL S OUTPUT jack of other Sony equipment. If you connect to the CONTROL S OUT jack of the supplied remote commander with the remote control (stereo or monaural) cable (not supplied), you can use the commander as a wired commander.
OUTPUT (stereo minijack): The signal from the CONTROL S INPUT jack is output. Connect to the CONTROL S INPUT jack of another projector when two or more projectors are used.
- 7 INPUT A connectors (BNC)**
R, G, B, SYNC/HD, VD connectors: Connect to the analog RGB outputs of a video camera or other video equipment.
Cb/R-Y, Y, Cr/B-Y connectors: Connect to video equipment that output component signals, such as Sony Betacam or DVD player.
- 8 Remote sensor**
- 9 AC IN socket**
Connect the supplied AC power cord (mains lead).
- 10 MAIN POWER switch (ON/OFF)**
Press to turn the main power on and off.

Remote Commander RM-PJV20

The remote commander may be used as a wired or wireless remote commander. The buttons with the same names as those on the control panel also have the same functions.



- 1 LIGHT button**
Press to light the button indicators.
To turn off the light, press it again while they are lit.
If you do not operate any button within about 30 seconds, the light automatically turns off.
- 2 Transmitter indicator**
The light turns on each time a button is pressed. When the indicator does not light, replace the batteries.
- 3 MUTING button**
PIC (picture): Press to cut off the picture. To restore the picture, press it again.
- 4 INPUT SELECT buttons**
- 5 RESET button**
- 6 TEST button**
- 7 R/B CENT buttons**
- 8 I/O (power on/standby) button**
Press to turn the projector on and off.
- 9 ASPECT button**
- 10 M SEL (memory select) button**
- 11 PAGE button**
- 12 Arrow buttons**

Location and Function of Controls

Battery Installation

- 1 Push and slide to open the lid.
- 2 Install three R6 (AA) batteries with the correct polarity.
- 3 Replace the lid.



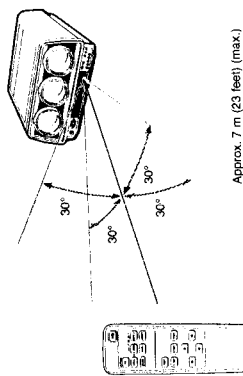
Notes

- If the projector does not operate properly, the batteries might be worn out. Replace all three of them with new batteries.
- The life of the batteries depends on frequency of usage and how often you use the LIGHT button. If they wear out quickly, replace them with new alkaline batteries.
- To avoid damage from possible battery leakage, remove the batteries when the remote commander will not be used for a long time.

Notes on wired commander operation

Even if the remote commander is connected to the CONTROL S IN jack of the projector via the remote control cable (not supplied), the power is not supplied to the remote commander from the projector. Install the batteries in the battery compartment when you use the remote commander as a wired remote commander.

Operable range of wireless remote control operation



Notes

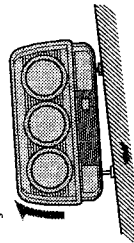
- Be sure that there are no obstructions between the remote commander and the projector.
- Operable range is limited. The shorter the distance between the remote commander and the projector, the wider the angle within which the remote commander can control the projector.

Using the Adjusters

You can adjust the horizontal tilt and the angle of the projector by turning the adjusters. The adjusters are set to the shortest length at the factory.

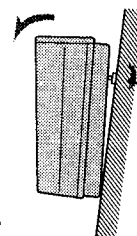
To adjust the horizontal tilt

Turn either adjuster to obtain horizontal balance.



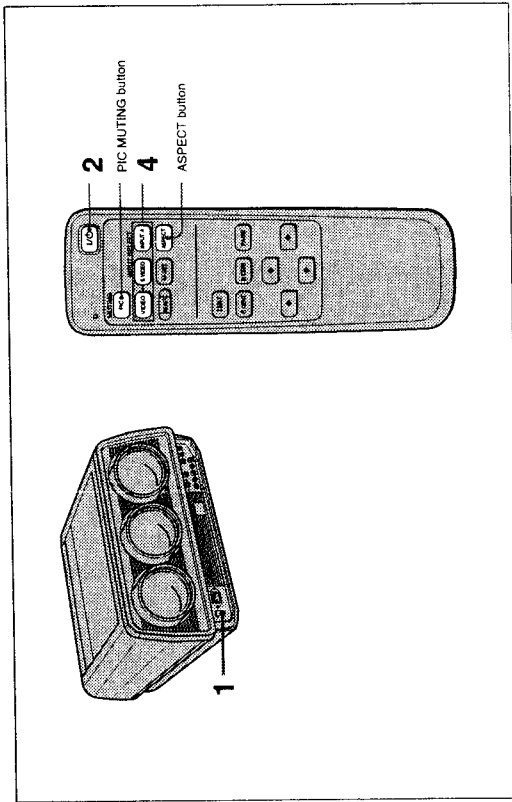
To adjust the angle

Turn both adjusters to adjust the angle.



Projecting

You can also use the buttons on the control panel with the same names as those on the remote commander to operate the projector.



- 1 Press down the MAIN POWER switch of the projector (ON).
 - 2 Turn on the power by pressing the I/O (power on/standby) button.
 - 3 Turn on the connected equipment.
 - 4 Press the INPUT SELECT button to select the input signal to be projected.
- VIDEO:** to select the signal input from the VIDEO IN VIDEO connector
- S VIDEO:** to select the signal input from the VIDEO IN S VIDEO connector
- INPUT A:** to select the signal input from the INPUT A connectors
- To project the RGB or component signal, press the PAGE button until the SYSTEM PRESET display appears. Press the $\blacktriangle$ or $\blacktriangledown$ button to select INPUT A and select RGB or COMPONENT with the $\blacktriangle$ or $\blacktriangledown$ button.

Projecting

To turn off the power

To turn off the projector

Press the I/O button or the MAIN POWER switch on the projector. If the projector is turned off with the MAIN POWER switch, the projector is turned on again only by the MAIN POWER switch.

To turn off the main power

Press the MAIN POWER switch on the projector. If you turn off the main power with the I/O button and the MAIN POWER switch, the projector is in standby mode when you press the MAIN POWER switch. Press the I/O button to turn on the projector.

To switch the aspect ratio

Press the aspect button.

When inputting 16:9 (squeezed) signal from equipment such as a DVD player, set to 16:9.

4:3 When the picture with ratio 4:3 is input.

16:9 When the picture with ratio 16:9 (squeezed) is input.

To cut off the picture

Press the PIC MUTING button.

To restore the picture, press the PIC MUTING button again.

If the picture rolls vertically

Turn the V HOLD control on the projector until the picture stabilizes.

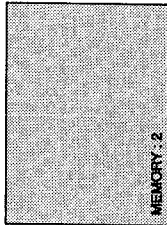
To adjust the horizontal position of the RGB input picture

Turn the H SHIFT control until the picture fits the screen.

Adjusting the Picture

Three adjustment level patterns for the video and component input pictures and one pattern for the RGB input picture, respectively, are stored in the projector's memory. You can recall them by pressing the M SEL button.

- 1 Press the M SEL button to select the memory position 1, 2 or 3.
The current memory position is displayed.



Each time you press the button, the memory position changes as follows: MEMORY 1 → MEMORY 2 → MEMORY 3 → MEMORY STD (standard).

In the MEMORY STD position, the adjustment levels are preset to the standard levels set at the factory, and you can not change them.

Note

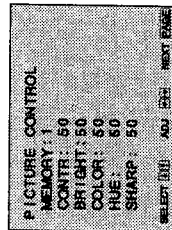
When the input signal is RGB, the memory position changes as follows: MEMORY 1 → MEMORY STD.

- 2 Press the PAGE button to display the PICTURE CONTROL display.

- 3 Select a item you want to change with the ◀ or ▶ button.

- 4 Adjust the item with ◀ or ▶ button.

The adjustment levels are digitally displayed on the screen having a range of MIN, 1, 2, ..., 98, 99, MAX.



	Press the ◀ button	Press the ▶ button
CONTR	to increase picture contrast	to decrease picture contrast
BRIGHT	to make the picture brighter	to make the picture darker
COLOR	to increase color intensity	to decrease color intensity
HUE	to make skin tones greenish	to make skin tones purplish
SHARP	to make the picture sharper	to make the picture softer

The adjustment levels are stored in the selected memory position.

Notes

- The COLOR, SHARP and HUE controls do not function when the input signal is RGB or when no signal is input.
- The HUE control does not function when the input signal is PAL or SECAM.
- The COLOR and HUE controls do not function when the input signal is black and white.

To recall the picture adjustment levels stored in the memory position

Press the M SEL button.

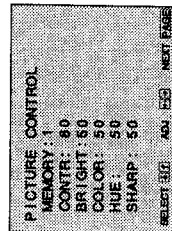
The current memory position is displayed.

Each time you press the button, you can select the following memory positions: MEMORY 1 → MEMORY 2 → MEMORY 3 → MEMORY STD

To restore the factory preset level

Press the RESET button while the PICTURE CONTROL display is displayed.

The factory preset level is displayed.



When you select the MEMORY STD position

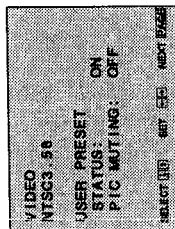
You can obtain the picture with the standard levels for all the adjustment items. The standard levels are the same as those obtained when you press the RESET button.

Projecting

Displaying the Current Control Settings

Press the **PAGE** button to display the following on-screen displays. You can change various settings on these displays. Each time you press the **PAGE** button, the display switches as follows: **USER PRESET** → **PICTURE CONTROL** → **SYSTEM PRESET**.

USER PRESET



VIDEO (S VIDEO, RGB, COMPONENT)
Current input signal

NTSC3.58 (NTSC4.43, PAL, SECAM, B & W)
Current input color source

STATUS: ON/OFF
On-screen display does not appear in OFF mode.

PIC MUTING: ON/OFF
The picture does not appear in ON mode.

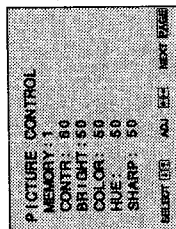
The items that do not function with the current input signal do not appear on the display.
To change the settings, select the item with the **▲** or **▼** button and change it with the **←** or **→** button.

Note

When the **STATUS** is set to OFF, no message appears on the screen. Therefore, there is no picture on the screen when no signal is input or when the **PIC MUTING** is set to ON. This is not a malfunction. Press the **PAGE** button to confirm the current control settings.

Be careful to leave the power on when no picture appears on the screen.

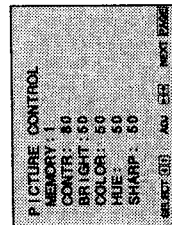
PICTURE CONTROL



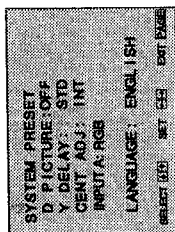
The current picture condition of each memory position, contrast, brightness, color, hue and sharpness, is displayed. The controls that do not function with the current input signal do not appear on the display.
To check other memory positions, press the **▲** or **▼** button to select **MEMORY** and select the desired memory position with the **←** or **→** button.
To adjust the picture adjustment levels, select the item with the **▲** or **▼** button (the selected item is colored yellow) and adjust it with the **←** or **→** button. For details on adjustment, see page 15.

To restore the factory preset levels for all the items

Press the **RESET** button while the **PICTURE CONTROL** display is displayed. The factory preset levels for all the items are displayed.



SYSTEM PRESET



D PICTURE

ON: to enhance the contrast, providing a dynamic image.
OFF: to display a dark portion faithfully according to the video source.

Y DELAY

Luminance and chroma (color) signals may be transmitted with a slight time lag depending on the video equipment. This results in color shift on the displayed picture.

If this happens, adjust the **Y DELAY** as follows:

+: when color shift is to the right
STD (standard): Normally set to this position.
-: when color shift is to the left

CENT ADJ

Set when you perform the centering adjustment.
INT (internal): to perform the centering adjustment with the built-in cross-hair test signal
EXT (external): to perform the centering adjustment using an external signal

INPUT A

Select the input signal from the **INPUT A** connectors.
RGB: to select the RGB signal
COMPONENT: to select the component signal

LANGUAGE

Select the on-screen display language if you prefer German, French, Italian or Spanish to English. Each time you press the **▲** button, the language changes as follows:

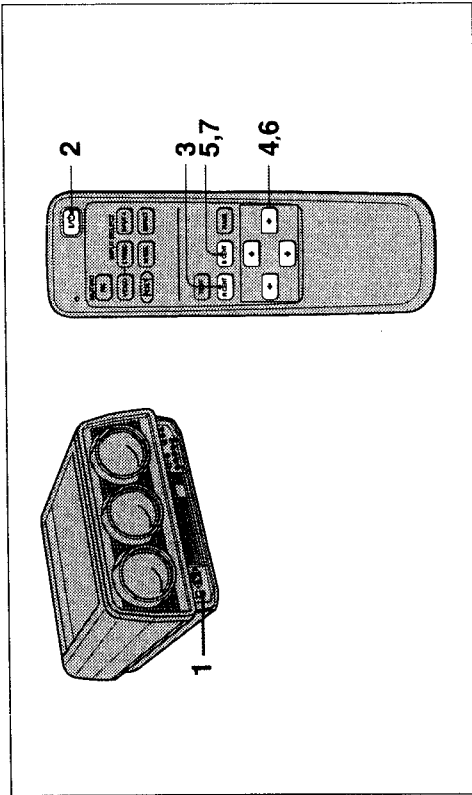
→ **ENGLISH** → **DEUTSCH** → **FRANCAIS**
← **ITALIANO** ← **ESPAÑOL** ←

Pressing the **▲** button changes the language in reverse. After selecting the language, press the **▲** or **▼** button. An on-screen display in the selected language appears.

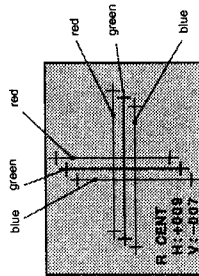
Centering Adjustment

The three colors, red, green and blue, must converge for proper projection. If you move the projector to another location, you have to perform the centering adjustment.

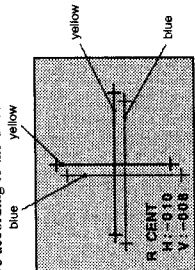
The following are the procedures for using a built-in test pattern. You can also perform the centering adjustment using an external test signal without displaying a test pattern. To use an external signal, change the CENT ADJ setting on the SYSTEM PRESET page. (See page 17.)



- 1 Press down the MAIN POWER switch of the projector.
- 2 Turn on the power by pressing the I/O button.
- 3 Press the R CENT button.
The built-in cross hair test pattern is displayed and you can adjust the red lines.

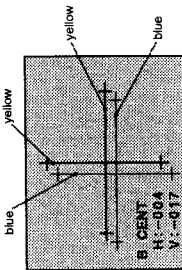


- 4 Press the arrow buttons to move the horizontal and vertical red lines until they converge with the center green lines and are seen as yellow. The red lines move according to the direction of the arrow.

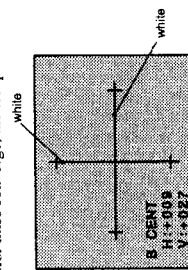


H: Horizontal adjustment level (MIN, -126 ~ +126, MAX)
V: Vertical adjustment level (MIN, -126 ~ +126, MAX)

- 5 Press the B CENT button.
You can adjust the blue lines.



- 6 Press the arrow buttons to move the horizontal and vertical blue lines until they converge with the yellow lines.
When all three color lines converge, the test pattern is seen as white.



- 7 Press the B CENT button.
The adjustment levels are stored and the normal display is restored.

To check the current centering condition

Press the TEST button.
The cross-hair test pattern is displayed.
To restore the normal display, press the TEST button again.

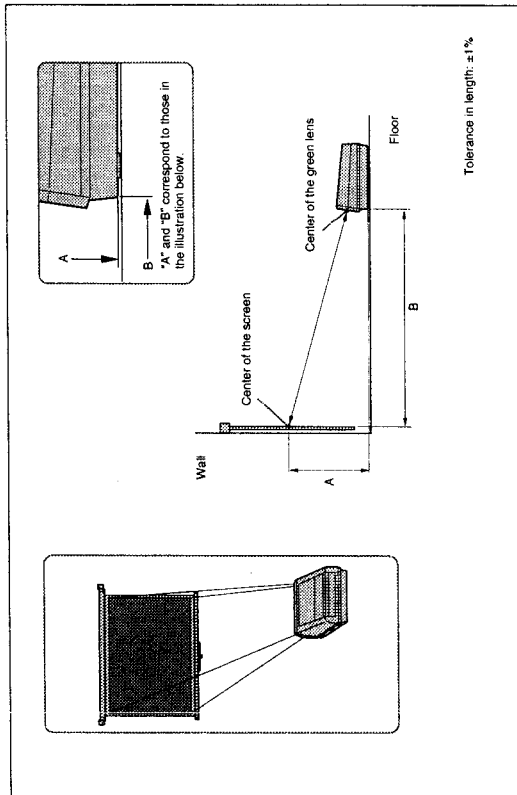
Note

The test patterns are displayed even when the STATUS in the USER PRESET display is set to OFF, but the adjustment items (R CENT and B CENT), horizontal and vertical adjustment levels are not displayed. Perform the centering adjustment after setting the STATUS to ON.

Installation Diagrams

Installation and preliminary adjustments should be carried out by qualified Sony personnel.

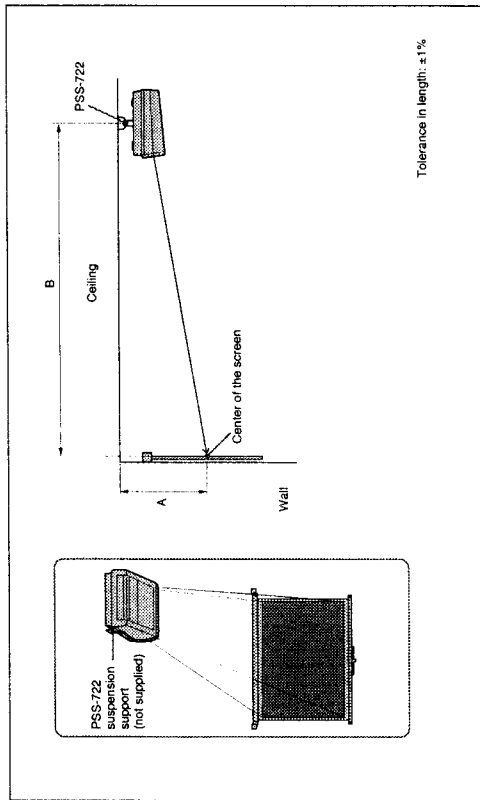
Installation 1 Floor Installation Using Front Projection Flat Screen



Screen size (inches)	Unit: mm (inches)	
	A	B
70	674 (26 5/8)	2,363 (93 1/8)
72	685 (27)	2,441 (96 1/8)
80	740 (29 1/4)	2,681 (105 5/8)
100*	873 (34 3/8)	3,301 (130)
120**	1,006 (39 5/8)	3,923 (154 1/2)
150	1,214 (47 7/8)	4,857 (191 1/4)
180	1,414 (55 3/4)	5,793 (228 1/8)
200	1,544 (60 7/8)	6,417 (252 3/4)
250	1,884 (74 1/4)	7,967 (313 3/4)

* Sony screen VPS-100FH
** Sony screen VPS-120FH

Installation 2 Ceiling Installation Using Front Projection Flat Screen

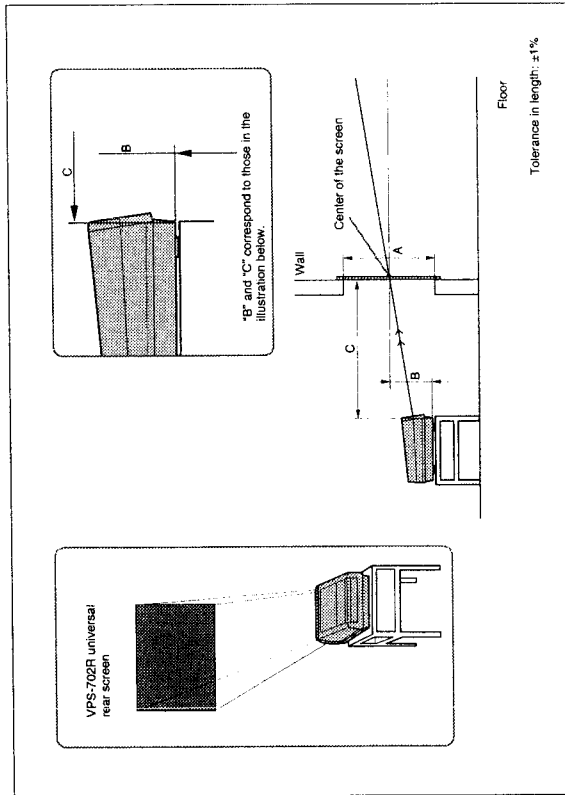


Screen size (inches)	Unit: mm (inches)	
	A	B
70	813 (32 1/8)	2,614 (103)
72	824 (32 1/2)	2,692 (106)
80	879 (34 5/8)	2,932 (114 3/4)
100*	1,012 (39 7/8)	3,552 (139 1/8)
120**	1,145 (45 1/8)	4,174 (164 3/8)
150	1,350 (53 1/4)	5,108 (202 1/8)
180	1,550 (61 1/8)	6,044 (238)
200	1,680 (66 1/4)	6,668 (262 5/8)
250	2,020 (79 1/4)	8,218 (323 5/8)

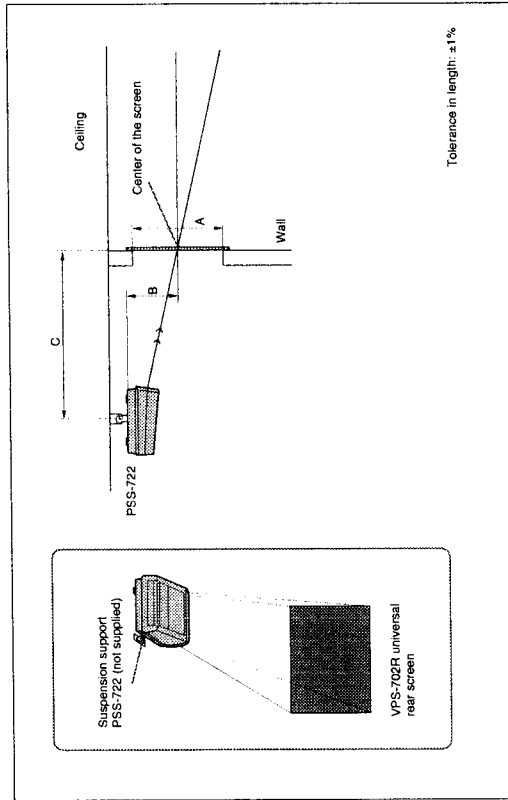
* Sony screen VPS-100FH
** Sony screen VPS-120FH

Installation Diagrams

Installation 3 Floor Installation Using Rear Projection

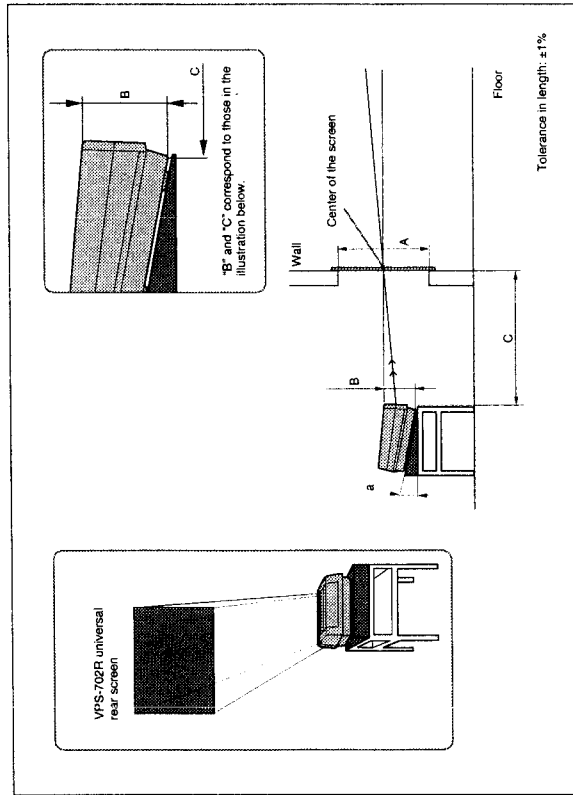


Installation 4 Ceiling Installation Using Rear Projection



Installation Diagrams

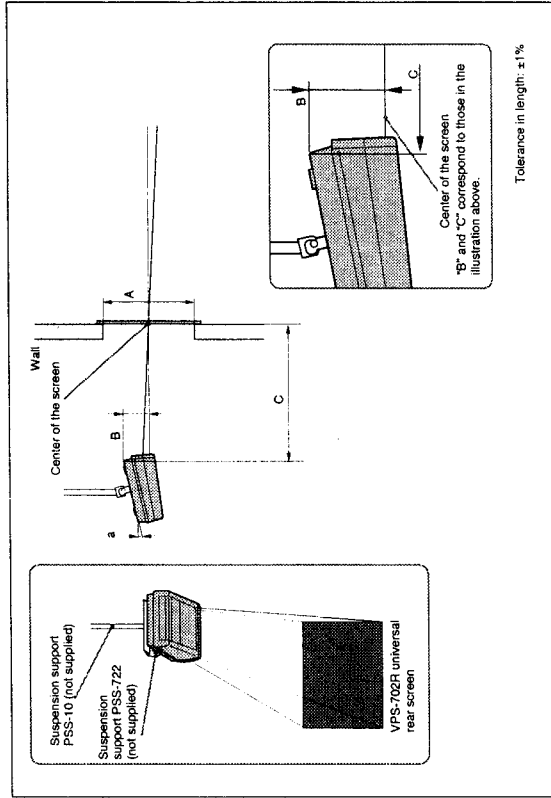
Installation 5 Level Projection, Floor Installation



Screen size (inches)	Unit: mm (inches)			Angle (°)	
	A	B	C	a	b
70"	1,067 (42 1/8)	165 (6 1/2)	2,439 (96 1/8)	12	12
	1,067 (42 1/8)	676 (26 5/8)	3,433 (95 7/8)	10	10
	1,524 (60 1/8)	167 (6 5/8)	3,402 (134)	12	12
100	1,524 (60 1/8)	715 (28 1/4)	3,402 (134)	10	10

* Sony screen VPS-702R

Installation 6 Level Projection, Ceiling Installation



Screen size (inches)	Unit: mm (inches)			Angle (°)	
	A	B	C	a	b
70"	1,067 (42 1/8)	165 (6 1/2)	2,439 (96 1/8)	12	12
	1,067 (42 1/8)	676 (26 5/8)	3,443 (95 7/8)	10	10
	1,524 (60 1/8)	167 (6 5/8)	3,402 (134)	12	12
100	1,524 (60 1/8)	715 (28 1/4)	3,402 (134)	10	10

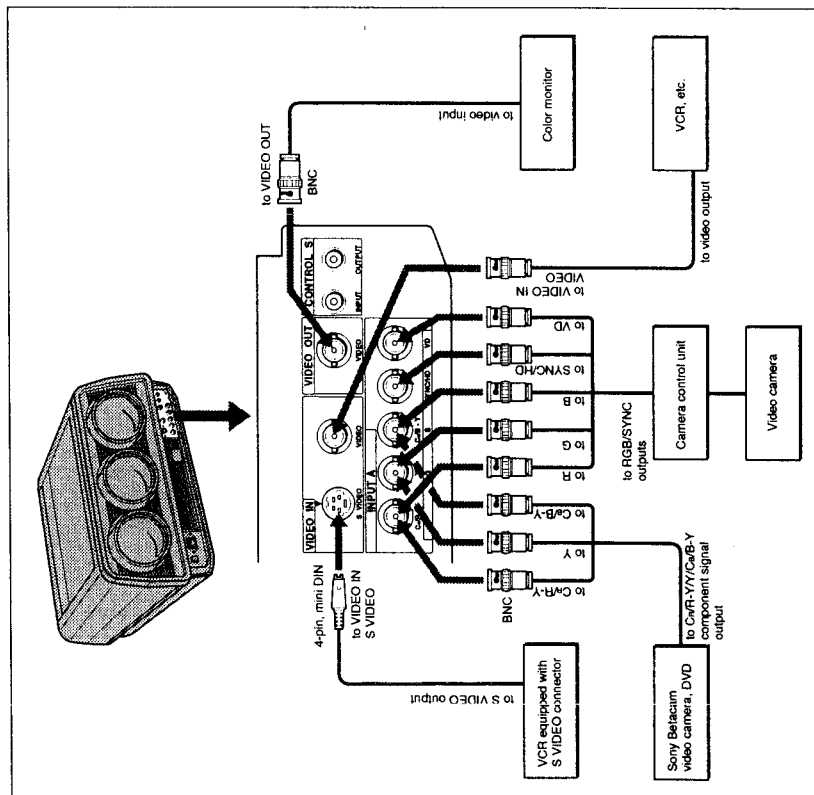
* Sony screen VPS-702R

List of the Messages

Notes on connections

- First make sure that the power to each piece of equipment is turned off.
- Use suitable connecting cables according to the equipment to be connected.
- The cable connectors should be fully inserted into the connectors of the equipment.
- To disconnect the cable, pull it out by grasping the plug. Never pull the cable itself.
- Refer to the instruction manual of the equipment to be connected.

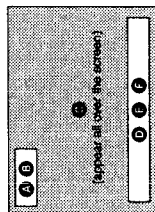
Connecting to the Projector



26 Installation/connection examples

Use the list below to check the meaning of the messages displayed on the screen.

The list is divided into sections according to the location where the message appears. Check the location first, then refer to the corresponding letter for the section to find the message.



A Input channel

VIDEO	Input from VIDEO IN VIDEO
S VIDEO	Input from VIDEO IN S VIDEO
INPUT A	Input from INPUT A
NO INPUT	No signal is input

g Input color source

The NTSC_{3.58} signal is input.
The NTSC_{4.43} signal is input.
The PAL signal is input.
The SECAM signal is input.
Black and white signal is input.

© PAGE

USER PRESET	
STATUS: ON/OFF	The on-screen display is displayed or cut.
PIC MUTING: ON/OFF	The picture is cut or displayed

PICTURE CONTROL

MEMORY: 1/2/3/STD		Picture adjustment memory position 1, 2, 3 or standard
CONTR	CONTRAST	Contrast
BRIGHT	BRIGHTNESS	Brightness
COLOR	COLOR	Color
HUE	HUE	Hue
SHARP	SHARPNESS	Sharpness

(continued)

List of the Messages

SYSTEM PRESET	
D PICTURE: ON/OFF	The Dynamic picture feature functions or not.
Y DELAY: +/-STD	Color shifts left or right, or does not shift.
CENT ADJ: EXT, INT	Centering adjustment is performed with an external test signal or a built-in cross-hair test pattern.
INPUT A: RGB/COMPONENT	Input signal from the INPUT A connectors is RGB or component.
LANGUAGE:	An on-screen display appears in English, German, French, Italian or Spanish.
DEUTSCH/FRANCAIS/ITALIANO/ESPAÑOL	
③ Operation	
SELECT: ♦♦	Press ♦ or ♦ to select.
ADJ: ♦♦	Press ♦ or ♦ to adjust.
SET: ♦♦	Press ♦ or ♦ to set.
NEXT: [PAGE]	Press the PAGE button to change to the next page display.
EXIT: [PAGE]	Press the PAGE button to exit the page display mode.
④ Adjustment/adjustment data	
R CENT	Red centering adjustment mode
B CENT	Blue centering adjustment mode
H: xxx	Horizontal adjustment level (xxx=MIN, -126 - +126, MAX)
V: xxx	Vertical adjustment level (xxx=MIN, -126 - +126, MAX)
⑤ Caution, Message	
Not Applicable:	The button does not function with the current condition.
PIC MUTING	The PIC MUTING button is pressed.
ASPECT RATIO	The current aspect ratio (4:3 or 16:9) is displayed.

Troubleshooting

If the projector appears to be operating erratically, try to diagnose and correct the problem using the following guide. If the problem still persists, consult with qualified Sony personnel.

The power does not turn on.

- The MAIN POWER switch is turned off.
- Press the MAIN POWER switch on the projector (see page 13).

Picture does not appear.

- If the control setting displays appear, external signal is not input correctly.
 - Check the current input signal in the USER PRESET display and correct it correctly (see page 16).
- The PCT MUTING in the USER PRESET display is set to ON.
 - Set it to OFF (see page 16).
- If the control setting displays do not appear, there may be an internal problem.
 - Consult with qualified personnel.

Picture is too dark.

- Contrast is set to minimum.
 - Adjust the contrast with the ♦ button in the PICTURE CONTROL display.

Picture is distorted.

- The picture may be distorted vertically when the signal is input such as an HDTV signal or an RGB signal (except fH=15 kHz) output from a computer.
 - Turn the V HOLD control on the projector until the picture stabilizes.

Specifications

Optical Characteristics

Projection system 3 picture tubes, Direct projection system

Picture tube 7-inch high-brightness monochrome tubes, with coolant sealed

Projection lens VPH-V20M/V20U High-performance hybrid lenses F1.0/130 mm VPH-V22M HACC (High-resolution Aspherical and Color Corrected) lenses

Projected picture size F1.0/135 mm

Factory-adjusted to 100 inches measured diagonally

70–250 inches measured diagonally adjustable by changing the parts

Peak: 700 lm

ANSI¹⁾ 100

Electrical Characteristics

Color system PAL, SECAM, NTSC and NTSC443 systems, switched automatically

Resolution 700 TV lines (video input) 1,000 TV lines (RGB input)

Test signal Cross-hair test pattern generator incorporated

Inputs

VIDEO IN S VIDEO: 4-pin mini DIN connector

Y (luminance) signal: 1 Vp-p±2 dB, sync negative, 75 ohms terminated

C (chrominance) signal: burst 0.286 Vp-p±2 dB, 75 ohms terminated (NTSC)

0.3 Vp-p±2 dB, 75 ohms terminated (PAL)

Chrominance signal (C)

Luminance signal (Y)

Ground

Ground

VIDEO: BNC connector

Composite video input, 1 Vp-p±2 dB, sync negative, 75 ohms terminated

terminated

INPUT A

R,G,B: BNC connectors Red, green, blue inputs

0.7 Vp-p±2 dB, 75 ohms terminated, positive

SYNC/HD: BNC connector

Composite sync input, 0.3–4 Vp-p, 75 ohms terminated, negative

Horizontal sync input, 0.3–4 Vp-p, 75 ohms terminated, negative

VD: BNC connector

Vertical sync input, 0.3–4 Vp-p, 75 ohms terminated, negative

Ck/R-Y, Cr/B-Y: BNC connectors 0.7 Vp-p

Y: BNC connector

1.0 Vp-p, sync negative, 75 ohms terminated

INPUT: Stereo minijack, 5 Vp-p

Outputs

VIDEO OUT

VIDEO: BNC connector

Composite video output, 1 Vp-p±2 dB, impedance 75 ohms, output video signal from the VIDEO IN connector

* The separated Y and C signals input to the S VIDEO connector is output as a composite video signal.

OUTPUT: Stereo minijack, 5 Vp-p

CONTROL S

General

Power requirements

VPH-V20U: 120V AC, 50/60 Hz

VPH-V20M/V22M: 220–240V AC, 50/60 Hz

Power consumption

VPH-V20U: 230 W max, 3.0 A max.

VPH-V20M/V22M: 210 W max.

Approx. 532 × 288 × 597 mm (w/h/d) (21 × 11 1/8 × 23 7/8 inches)

With the brackets pushed down, including the projection parts and controls

VPH-V20M/V20U: Approx. 30 kg (66 lb 2 oz)

VPH-V22M: Approx. 38 kg (83 lb 12 oz)

Mass

1) ANSI lumen is a measuring method of American National Standard IT 7.215.

Accessories supplied

Remote commander RM-PJV20 with 3 AA (R6) batteries

AC power cord (1)

Spacer for 200" front projection (4)

0.2 mm spacer ① for 70" to 100" (9)

0.8 mm spacer ② for 70" to 100" rear projection (3)

Design and specifications are subject to change without notice.

Optional accessories

Projector suspension support PSS-722, PSS-10

Screen VPS-100FH (100" flat)

VPS-120FH (120" flat)

VPS-702R (70" rear projection)

Remote control receiver RM-PJ10

Remote control cable

SONY.

3-855-080-11(1)

Color Video Projector

GB

Installation Manual for Dealers Page 2

**VPH-V20M/V20U
VPH-V22M**

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Installation

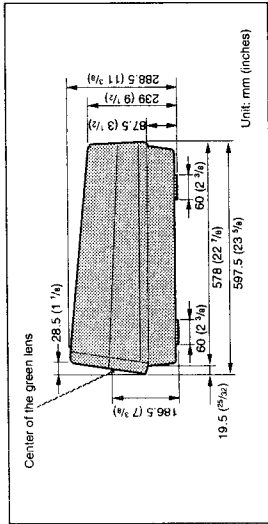
Before Installing	3
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Installation Diagrams	8
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Ceiling Installation Using Front Projection Flat Screen	9
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Floor Installation Using Rear Projection Screen	11
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Detaching the Lens Block	18
Changing the CRT Spacer	19
Adjusting the Lens Spacer for 150- to 250-inch Projection	23
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Adjustment

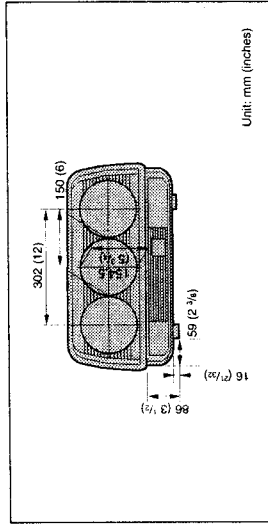
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Projector Dimensions

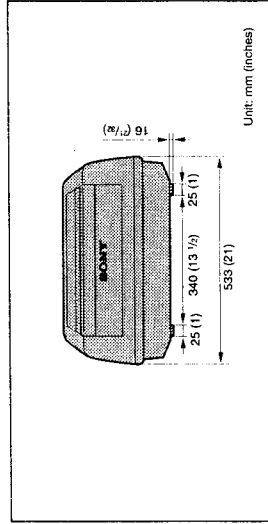
Side



Front

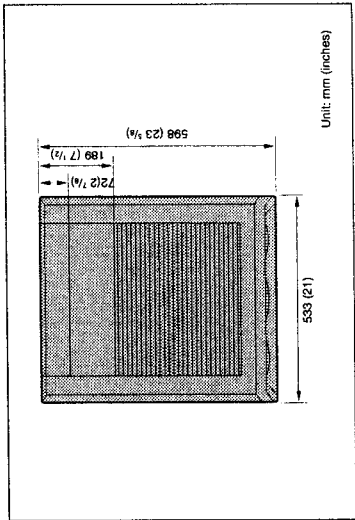


Rear



Before Installing

Top



Illumination

To obtain a clear picture, the screen should not be exposed to illumination or sunlight directly from the front.

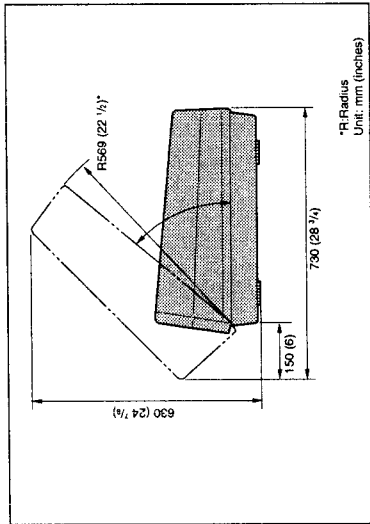
- Ceiling mounted spot lighting is recommended. Use a construction over light scattering illumination such as fluorescent lamps.
- Cover the windows that face the screen with opaque draperies.
- It is desirable to install the projector in a room whose floor and walls are of reflecting material, it would be desirable to change to a dark carpet and wall paper.

Caution

Take care not to touch portions of the projector other than those indicated in this manual because dangerous high voltages are present. To change the polarity, first turn the MAIN POWER switch off.

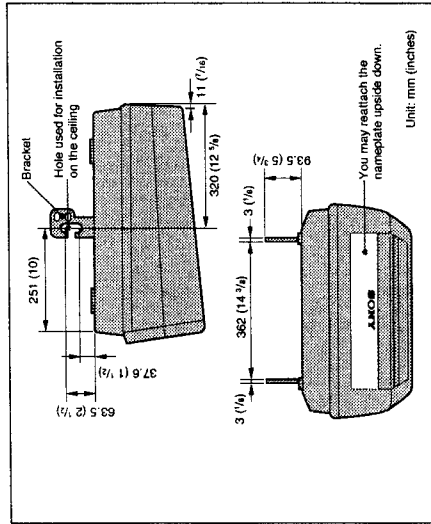
Necessary Clearance for Maintenance

When you install the projector, be sure to provide the clearance around it as shown for maintenance service.



Necessary Dimensions for Ceiling Installation

Raise the brackets at the bottom.

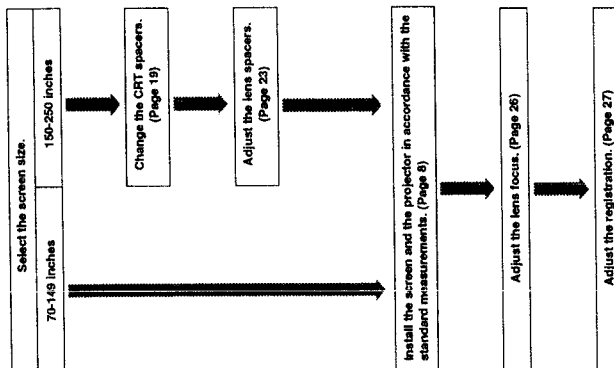


Before Installing

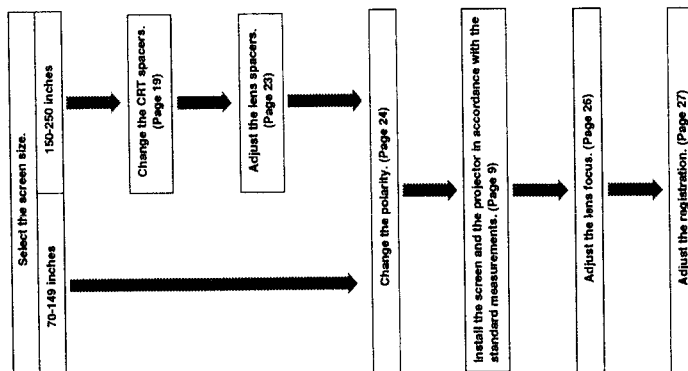
Installation Procedures

This projector is adjusted at the factory for projection on a 100-inch front projection type screen when the projector is installed on the floor/desk. If you install the projector under other conditions, modifications of some parts in the projector are required. Therefore, installation procedures vary depending on the screen size, installation method and type of screen.

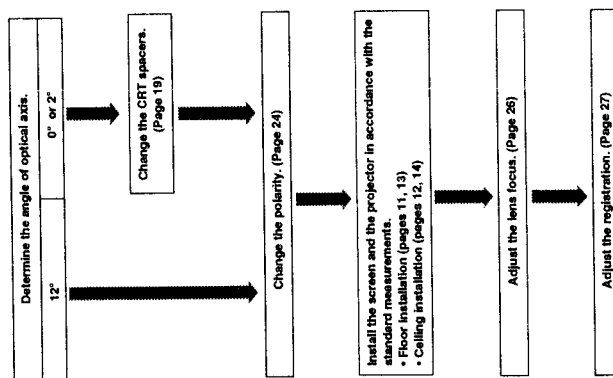
Floor Installation Using Front Projection Flat Screen



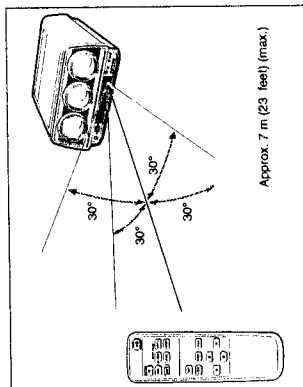
Ceiling Installation Using Front Projection Flat Screen



Floor or Ceiling Installation Using Rear Projection Flat Screen



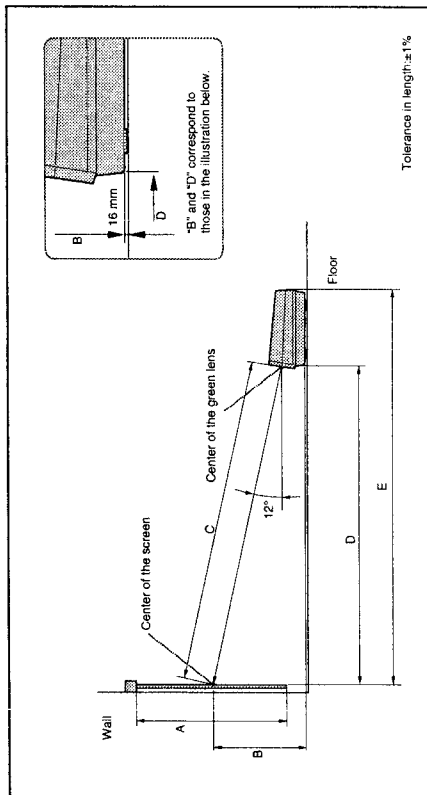
Operable range of the Remote Commander



Installation Diagrams

Floor Installation Using Front Projection Flat Screen

Be sure that the projector is parallel to the floor.



Screen size (inches)	Length: mm (inches)				
	A	B	C	D	E
70	1,067 (42 1/8)	674 (26 5/8)	2,406 (94 3/4)	2,363 (93 1/8)	2,934 (115 5/8)
72	1,097 (43 1/4)	685 (27)	2,480 (97 3/4)	2,441 (96 1/8)	3,012 (118 5/8)
80*	1,219 (48)	740 (29 1/4)	2,734 (107 3/4)	2,681 (105 5/8)	3,252 (128 1/8)
100*	1,524 (60 1/8)	873 (34 3/8)	3,368 (132 1/8)	3,301 (130)	3,872 (152 1/2)
120**	1,829 (72 1/8)	1,006 (39 5/8)	4,004 (157 11/16)	3,923 (154 1/2)	4,494 (177)
150	2,286 (90 1/8)	1,214 (47 7/8)	4,961 (195 3/8)	4,857 (191 1/4)	5,428 (213 3/4)
180	2,743 (108 1/8)	1,414 (55 5/8)	5,918 (231 1/8)	5,793 (228 1/8)	6,364 (250 5/8)
200	3,048 (120 1/8)	1,544 (60 7/8)	6,555 (258 1/8)	6,417 (252 3/4)	6,988 (275 1/4)
250	3,810 (150 1/8)	1,884 (74 1/4)	8,142 (320 7/8)	7,967 (313 3/4)	8,538 (336 1/4)

*Sony screen VPS-80FH

**Sony screen VPH-100FH

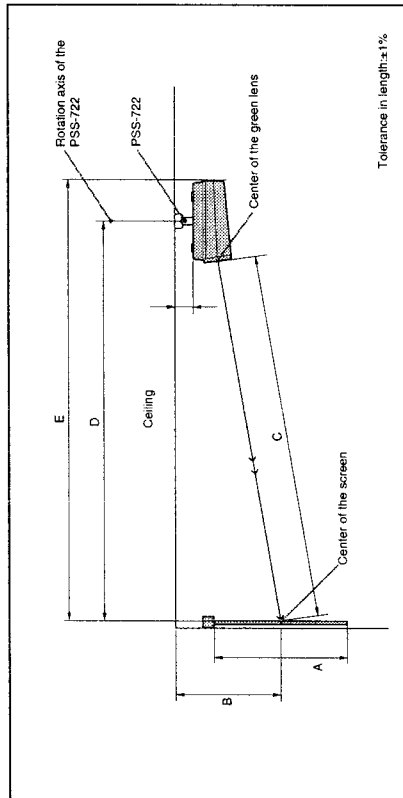
***Sony screen VPS-120FH

Necessary modifications of parts(only for use of the 150- to 250-inch screens)

- CRT spacer change (page 19)
- Lens spacer adjustment (Page 23)

Ceiling Installation Using Front Projection Flat Screen

Be sure that the projector is parallel to the ceiling. Use the Sony PSS-722 projector suspension support.



Screen size (inches)	Length: mm (inches)				
	A	B	C	D	E
70	1,067 (42 1/8)	813 (32 1/8)	2,406 (94 3/4)	2,614 (103)	2,934 (115 5/8)
72	1,097 (43 1/4)	824 (32 1/4)	2,480 (97 3/4)	2,692 (106)	3,012 (118 5/8)
80*	1,219 (48)	879 (34 3/8)	2,734 (107 3/4)	2,932 (114 3/4)	3,252 (128 1/8)
100*	1,524 (60 1/8)	1,012 (39 7/8)	3,368 (132 1/8)	3,552 (139 7/8)	3,872 (152 1/2)
120**	1,829 (72 1/8)	1,145 (45 1/8)	4,004 (157 11/16)	4,174 (164 3/8)	4,494 (177)
150	2,286 (90 1/8)	1,350 (53 1/4)	4,961 (195 3/8)	5,108 (201 1/8)	5,428 (213 3/4)
180	2,743 (108 1/8)	1,550 (61 1/8)	5,918 (231 1/8)	6,044 (238)	6,364 (250 5/8)
200	3,048 (120 1/8)	1,680 (66 1/8)	6,555 (258 1/8)	6,668 (262 5/8)	6,988 (275 1/4)
250	3,810 (150 1/8)	2,020 (79 9/16)	8,142 (320 7/8)	8,218 (323 5/8)	8,538 (336 1/4)

*Sony screen VPS-80FH

**Sony screen VPS-100FH

***Sony screen VPS-120FH

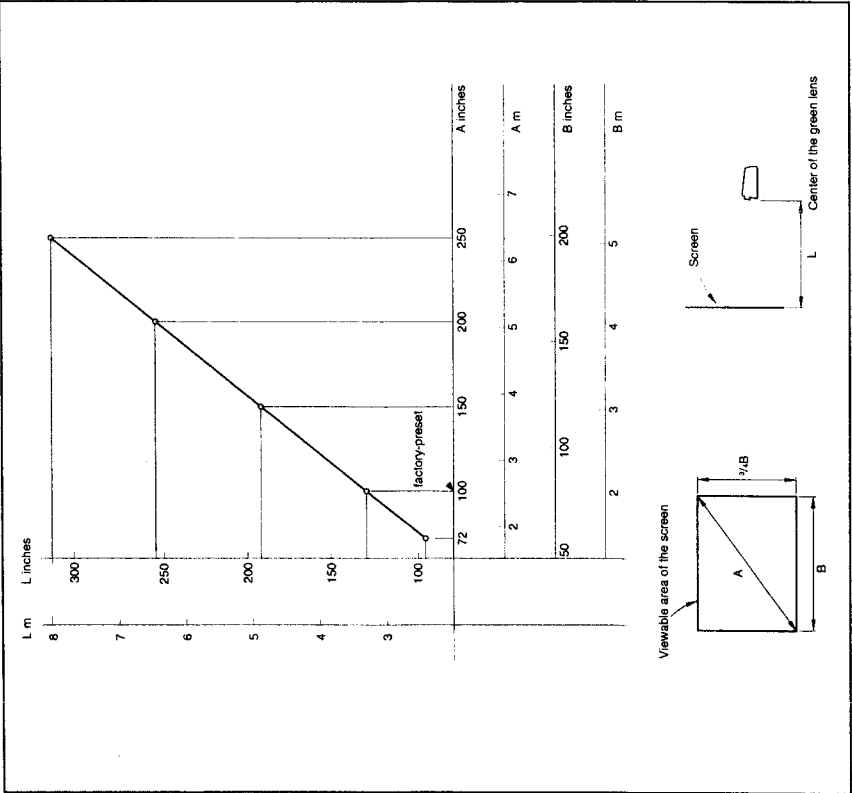
Necessary modification of parts

- CRT spacer change (only for use of 150- to 250-inch screens) (page 19)
- Lens spacer adjustment (only for use of 150- to 250-inch screens) (page 23)
- Horizontal and vertical deflection changes (page 24)

Installation Diagrams

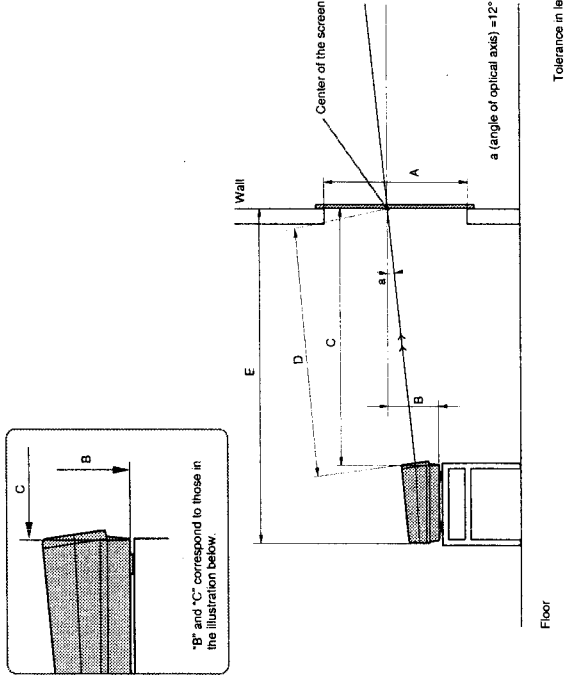
When the Screen Size is Not Described in the Diagrams

When using the front projection flat screen for floor and ceiling installations, use the following graph to decide the distance between the screen and the projector (L).



Floor Installation Using Rear Projection Flat Screen

When the angle of optical axis is 12°



Screen size (inches)	A	B	C	D	E
70"	1,067 (42 1/4)	690 (27 1/4)	2,363 (93 1/4)	2,406 (94 3/4)	2,934 (115 5/8)
100	1,524 (60 1/4)	889 (35)	3,301 (130)	3,368 (132 5/8)	3,872 (152 1/2)

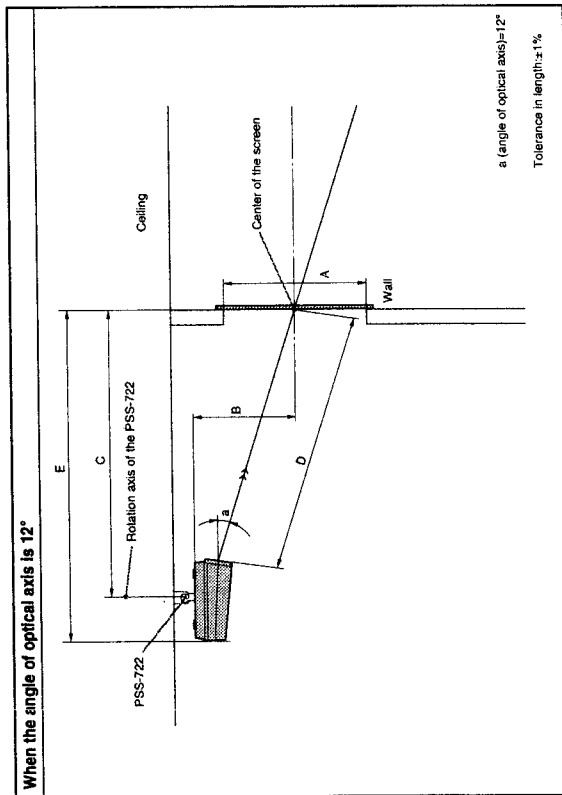
*Sony screen VPS-702R

Necessary modifications of parts

• Horizontal deflection change (page 24)

Installation Diagrams

Ceiling Installation Using Rear Projection F5-722 Screen



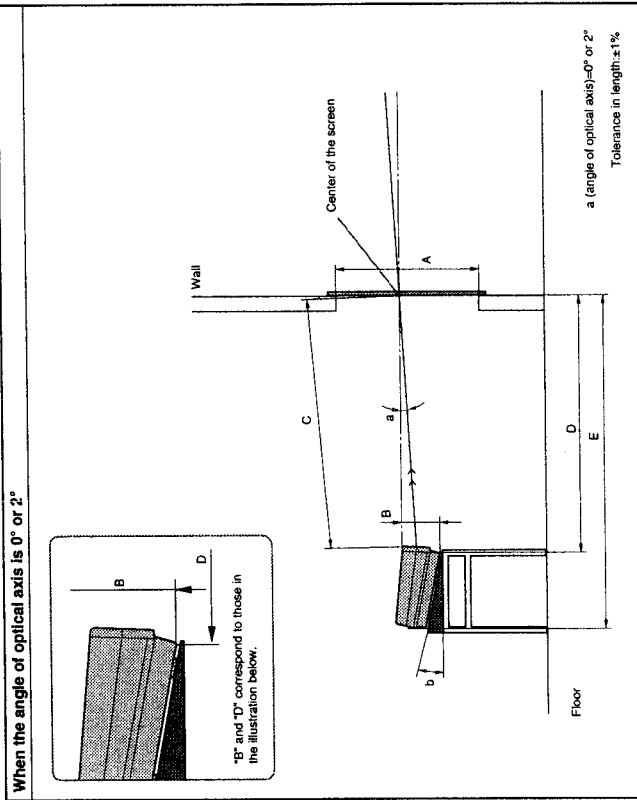
Screen size (Inches)	Length: mm (Inches)				
	A	B	C	D	E
70"	1,087 (42 1/4)	674 (26 5/8)	2,614 (103)	2,406 (94 3/4)	2,934 (115 5/8)
100	1,524 (60 1/4)	873 (34 3/8)	3,552 (139 7/8)	3,368 (132 5/8)	3,872 (152 1/2)

*Sony screen VPS-702R

Necessary modifications of parts

- Vertical deflection change (page 24)

Level Projection, Floor Installation



Screen size (Inches)	Length: mm (Inches)					Angle (°)	
	A	B	C	D	E	a	b
70"	1,087 (42 1/4)	165 (6 1/2)	2,397 (93 3/4)	2,439 (103)	2,982 (116 3/4)	0	12
100	1,524 (60 1/4)	167 (6 5/8)	2,450 (95 3/4)	2,433 (95 7/8)	2,982 (116 3/4)	2	10
						0	12
						2	10

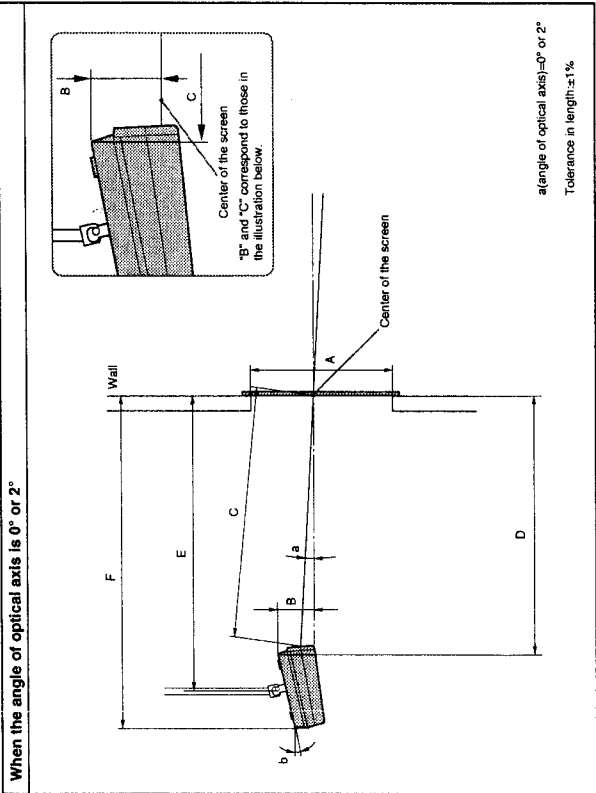
*Sony screen VPS-702R

Necessary modifications of parts

- CRT spacer change (page 20)
- Horizontal deflection change (page 24)

Installation Diagrams

Level Protection, Ceiling Installation



Screen size (Inches)	Length: mm (Inches)						Angle (°)	
	A	B	C	D	E	F	a	b
70"	1,067 (42 1/8)	165 (6 1/2)	2,397 (93 3/4)	2,439 (103)	2,698 (106 1/4)	2,982 (118 3/4)	0	12
	1,067 (42 1/8)	676 (26 5/8)	2,450 (94 3/4)	2,433 (95 7/8)	2,691 (106)	2,992 (118 3/4)	2	10
100	1,524 (60 1/8)	167 (6 5/8)	3,368 (132 1/4)	3,402 (134)	3,669 (144 1/2)	3,954 (155 3/4)	0	12
	1,524 (60 1/8)	715 (28 1/4)	3,441 (135 1/2)	3,402 (134)	3,661 (144 1/4)	3,951 (155 5/8)	2	10

*Sony screen VPS-702R

Necessary modifications of parts

- CRT spacer change (page 20)
- Vertical deflection change (page 24)

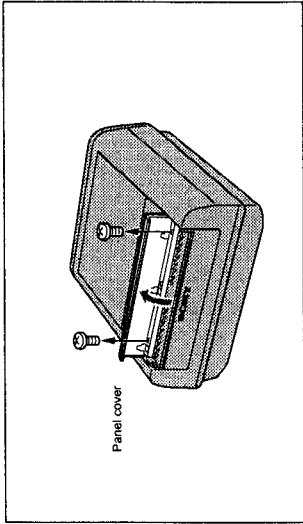
Modifications of Parts

When modifying certain parts in the projector, such as changing polarity, open the top panel, remove the cabinet, or detaching the lens block.

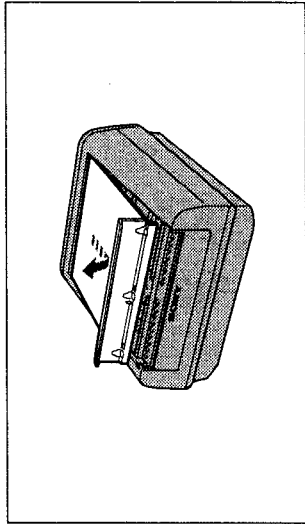
Opening the Top Panel

Use a medium size Philips head screwdriver.

- 1 Open the control panel cover and remove the two screws.



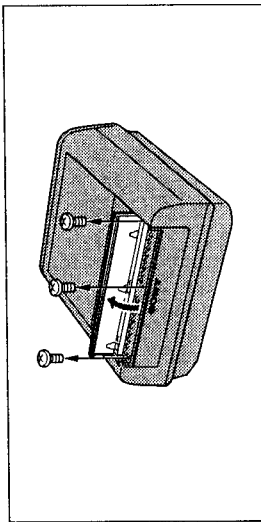
- 2 Pull the top panel slightly toward you and remove it.



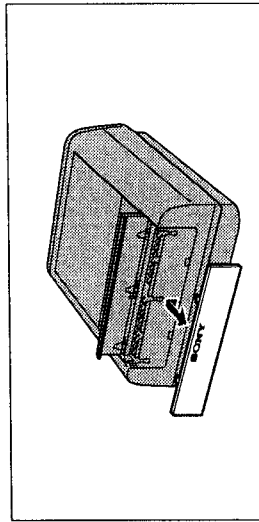
Modifications of parts

Removing the Cabinet

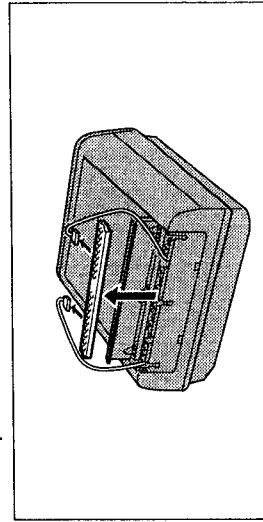
- 1 Open the control panel cover and remove the three screws on the control panel.



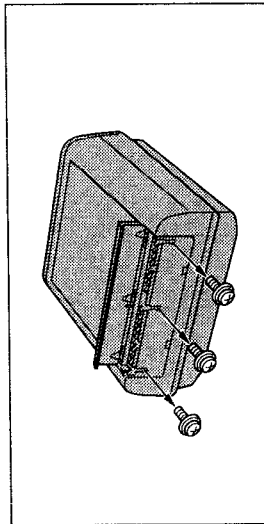
- 2 Slide the nameplate upward and pull it toward you to remove.



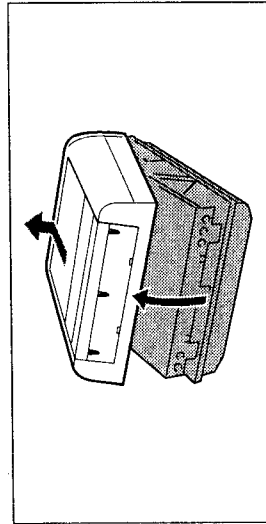
- 3 Remove the two connectors from the control panel and remove the control panel.



- 4 Remove the three screws.



- 5 Raise the cabinet and slide it away from you to remove.



To reinstall the cabinet

Caution

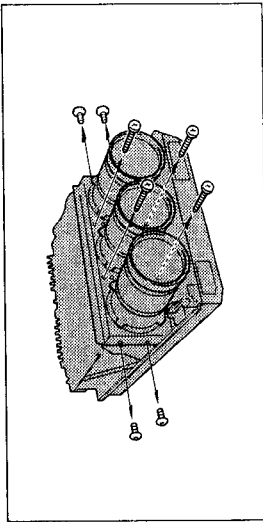
Make sure that the cables inside the projector are not caught when replacing the cabinet or the control panel.

- 1 Replace the cabinet.
- 2 Tighten the three screws on the nameplate attachment portion.
- 3 Connect the two connectors to the control panel, then replace the control panel.
- 4 Insert the nameplate.
- 5 Tighten the three screws on the control panel.

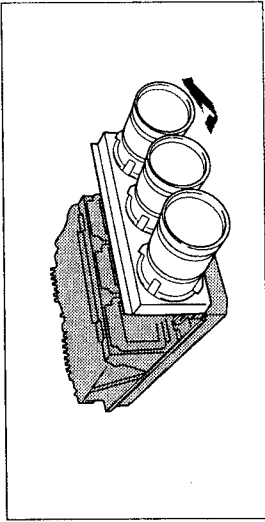
Modifications of parts

Detaching the Lens Block

- 1 Remove the cabinet.
- 2 Remove the 4 screws from the sides and the 4 screws from the lens base of the projector.



- 3 Pull the lens block out toward you.

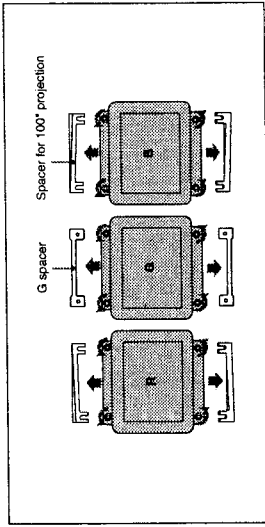


Changing the CRT Spacer

To change the CRT spacers for 150- to 250- inch projection

Use an 8 mm nutdriver.

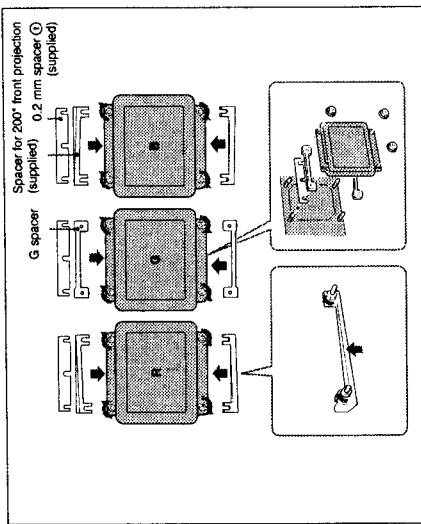
- 1 Remove the cabinet. (See "Removing the cabinet".)
- 2 Detach the lens block. (See "Detaching the lens block".)
- 3 Loosen the four nuts and remove the two spacers from the top and the bottom of each CRT.



- 4 Insert the supplied spacers for 200" front projection, 0.2 mm spacers ① and G spacers as follows:

Red and blue CRTs: A spacer for 200" and a 0.2 mm spacer ① for the top, a spacer for 200" for the bottom.
Insert the spacer for 200" front projection with the thinner end toward the center CRT.
Green CRT: The G spacer removed in step 3 and a 0.2 mm spacer ① for the top, the G spacer removed in step 3 for the bottom

Modifications of parts

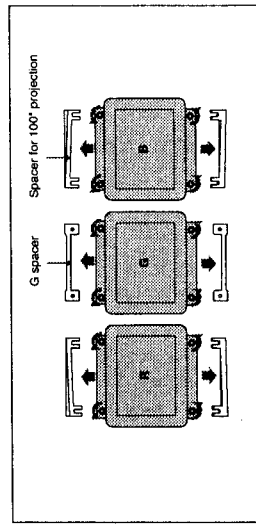


- 5 Tighten the four nuts of each CRT securely for accurate lens angles.
- 6 Reinstall the lens block, the cabinet and the top panel.

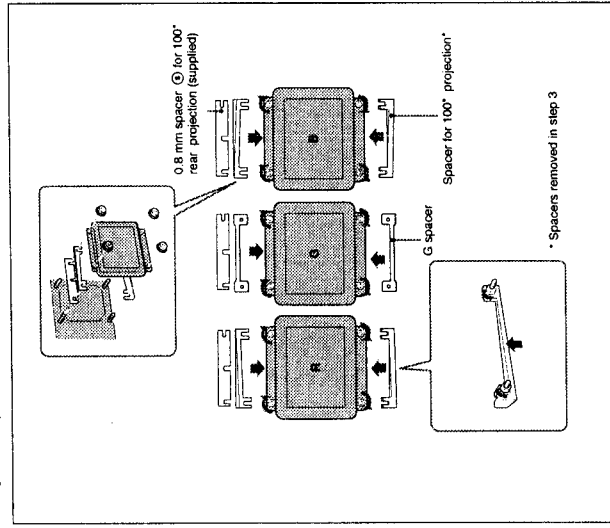
To change the CRT spacers for rear projection

Use an 8 mm nutdriver.

- 1 Remove the cabinet. (See "Removing the cabinet".)
- 2 Detach the lens block. (See "Detaching the lens block".)
- 3 Loosen the four nuts and remove two spacers from the top and the bottom of each CRT.

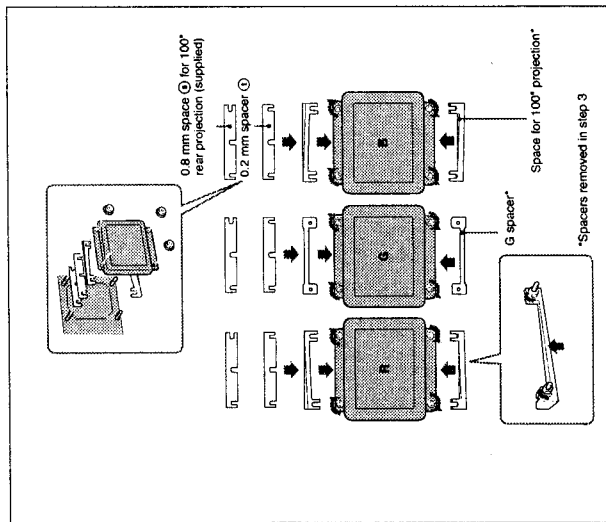


- 4 Insert the supplied 0.8 mm spacers ④ for 100" rear projection, 0.2 mm spacers ⑤, the spacers for 100" projection and G spacers as follows:
When the angle of optical axis is 0°
Blue and red CRTs: A 0.8 mm spacer ④ and the spacer for 100" removed in step 3 for the top, the spacer for 100" removed in step 3 for the bottom.
Green CRT: A 0.8 mm spacer ④ and the G spacer removed in step 3 for the top, the G spacer for the bottom.



Modifications of parts

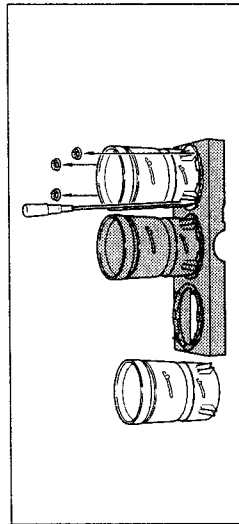
When the angle of optical axis is 2°
Red and blue CRTs: A 0.8 mm spacer ①, a 0.2 mm spacer ② and the spacer for 100" removed in step 3 for the top, the spacer for 100" removed in step 3 for the bottom.
Green CRT: A 0.8 mm spacer ①, 0.2 mm spacer ② and the G spacer removed in step 3 for the top, the G spacer removed in step 3 for the bottom



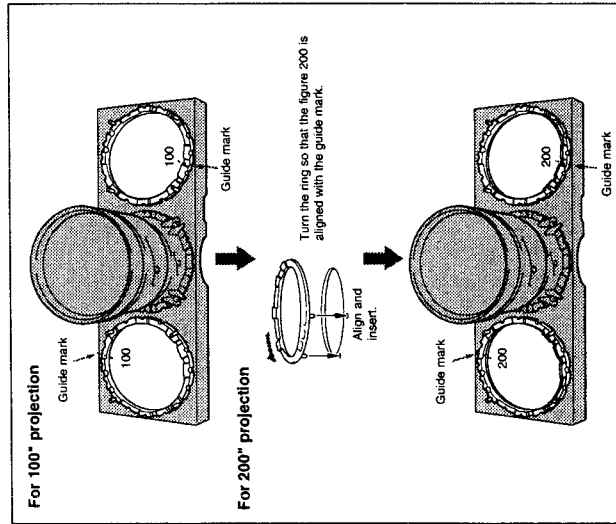
- 5** Tighten the four nuts of each CRT securely for accurate lens angles.
- 6** Reinstall the lens block, the cabinet and the top panel.

Adjusting the Lens Spacer for 150- to 250-inch Projection

- 1** Remove the cabinet.
- 2** Detach the lens block.
- 3** Detach the red and blue lenses from the lens base. Remove the four nuts of each lens to detach.



- 4** Adjust the positions of the lens spaces.

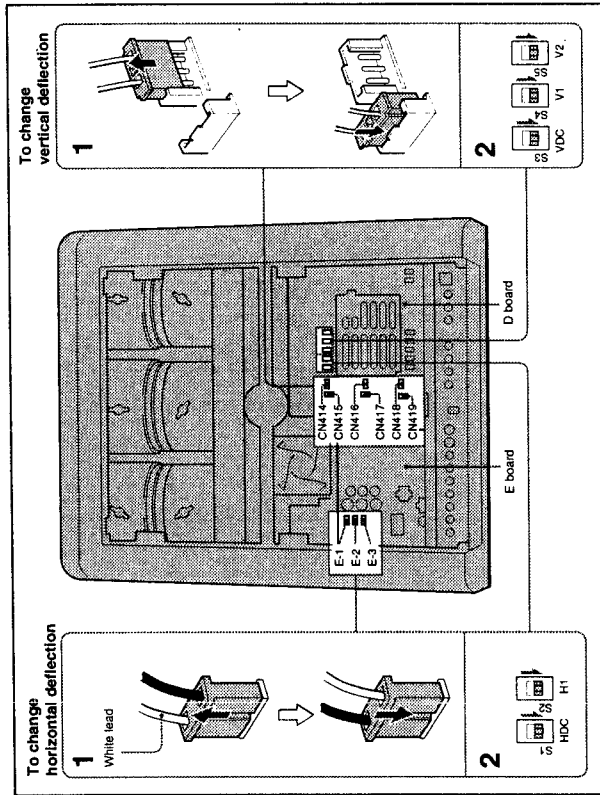


Modifications of parts

Changing the Polarity

The projector is preset at the factory for use in front projection when installed on the floor/desk. When the projector is installed on the ceiling or used in rear projection, change the polarity. Horizontal and/or vertical deflections should be changed depending on the type of installation.

Front projection, ceiling: Horizontal and vertical
Rear projection, floor/desk: Horizontal
Rear projection, ceiling: Vertical



Preparation

- Turn off the power.
- Open the top panel. (See page 15).

Changing the horizontal deflection

- 1 Reverse the polarity of connectors E-1, E-2 and E-3 on the E board.
- 2 Set the S1 and S2 switches on the D board to the control panel side position.

24 Installation

Note

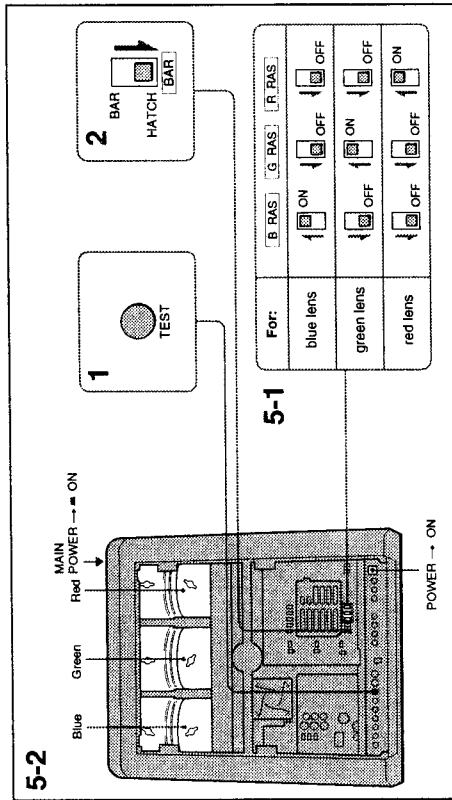
Make sure to insert the connectors firmly.

Changing the vertical deflection

- 1 Move the connectors on the D board from the receptacles CN414, CN416 and CN418 to receptacles CN415, CN417 and CN419, respectively.
- 2 Set the S3, S4 and S5 switches on the D board to the control panel side position.

Lens Focus Adjustment

The lens focus is adjusted at the factory for a 100" flat screen. For other types of screens, you should adjust the lens focus.



Preparation

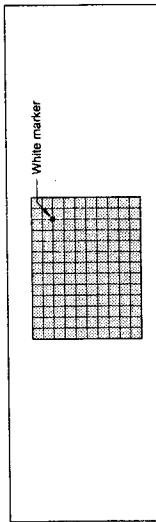
- 1 Install the projector in the correct location.
- 2 Open the top panel. (See page 15.)
- 3 Connect the supplied power cord (mains lead) to the AC IN socket and to an AC outlet.
- 4 Press down the MAIN POWER switch. Press the POWER button on the control panel, if necessary.

Adjustment 25

Lens Focus Adjustment

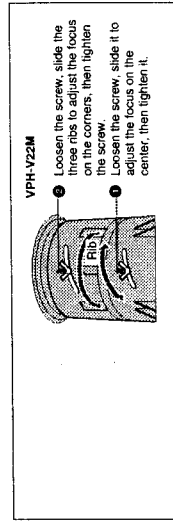
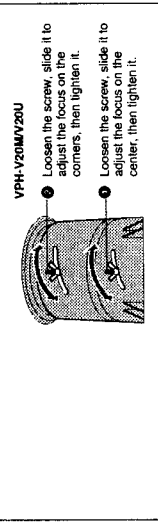
Adjusting the Lens Focus

- 1 Press the TEST button on the control panel.
- 2 Set the BAR switch to HATCH.
A cross hatch pattern is displayed.
- 3 Check that the cross hatch pattern is displayed inside the screen. If not, adjust the location of the projector.
- 4 Check that a white marker is displayed at the upper right as illustrated below. (See page 24.)



5 Adjust the lens focus.

- 1 Set the B RAS, G RAS and R RAS switches as illustrated above.
- 2 Adjust the focus of blue, green and red lenses as follows:



Registration Adjustment

Use a small screwdriver to adjust the controls through the holes.

MAIN POWER → ON

POWER → ON
BAR → HATCH
TEST
B CENT
R CENT

Screen size	MODEL SELECT	SIZE SELECT
72" (70"-85")	100	15072
100" (85"-125")	100	NORMAL
150" (125"-175")	200	15072
200" (175"-250")	200	NORMAL

To adjust: B RAS G RAS R RAS

Red registration: ON OFF ON ON OFF

Blue registration: ON ON ON ON OFF

Controls for registration adjustment

These controls are used for the reference green registration adjustment. For the red and blue registration, consult qualified Sony personnel.

MAIN-V-PIN MAIN-H-PIN MAIN-V-BOW MAIN-H-BOW

GV SIZE LIN SKEW BOW MAIN-V-SIZE MAIN-V-LIN MAIN-H-SIZE MAIN-H-LIN

RV RH BV BH TILT-1 TILT-2 TILT-3 TILT-4

The circled numbers correspond to the step numbers (circled numbers) in the adjustment procedure on the next page.

Registration Adjustment

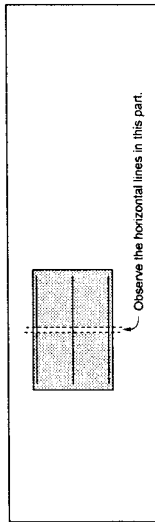
Preparations

- 1 Press the TEST button on the control panel to display the cross hair pattern.
- 2 Set the G RAS switch to ON and the B RAS and R RAS switches to OFF.
A green cross hatch pattern is displayed.
- 3 Check the location of the projector, polarity and lens focus.
- 4 Set the MODEL SELECT and SIZE SELECT switches to appropriate positions according to the screen size.

Adjusting the Red Registration

Vertical registration adjustment

- 1 Set the B RAS switch to OFF and the G RAS and R RAS switches to ON.
Green and red hatch patterns are displayed.
- 2 Press the R CENT button on the control panel and set the H and V adjustment levels to "00" with the arrow buttons.
- 3 Adjust the RV CENT control so that the red and green horizontal lines converge in the center of the screen.
- 4 Adjust the RV SIZE control (and the RV LIN control, if necessary) so that the red and green horizontal lines converge at the upper and lower sides of the screen.

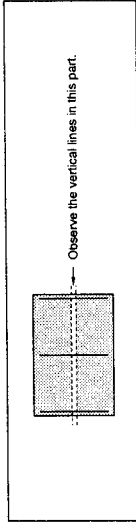


(If necessary, repeat steps 3 and 4.)

- 5 Adjust the RV SKEW and RV BOW controls if the red and green horizontal lines do not converge in the middle of the screen.
- 6 Adjust the RV TILT-1 through TILT-4 controls so that the red and green horizontal lines converge on the corners of the screen.

Horizontal registration adjustment

- 7 Adjust the RH CENT control so that the red and green vertical lines converge in the center of the screen.
- 8 Adjust the RH SIZE control (and the RH LIN control, if necessary) so that the red and green vertical lines converge at the right and left sides of the screen.



(If necessary, repeat steps 7 and 8.)

- 9 Adjust the RH SKEW and RH BOW controls so that the red and green vertical lines converge in the middle of the screen.
- 10 Adjust the RH TILT-1 through TILT-4 controls so that the red and green vertical lines converge on the corners of the screen.

Adjusting Blue Registration

Proceed to the following blue registration adjustment in the same manner as with red registration adjustment. Set the R RAS switch to OFF and the B RAS and G RAS switches to ON.

Vertical registration adjustment

- 11 Press the B CENT button on the control panel and set the H and V adjustment levels to "00" with the arrow buttons.
- 12 Adjust the BV CENT control to adjust the center of the screen.
- 13 Adjust the BV SIZE control, and the BV LIN control if necessary, to adjust the upper and lower sides of the screen.
- 14 Adjust the BV SKEW and BV BOW controls to adjust the middle of the screen, if necessary.
- 15 Adjust the BV TILT-1 through TILT-4 controls to adjust the corners.

Horizontal registration adjustment

- 16 Adjust the BH CENT control to adjust the center of the screen.
- 17 Adjust the BH SIZE control, and the BH LIN control if necessary, to adjust the right and left sides of the screen.
- 18 Adjust the BH SKEW and BH BOW controls to adjust the middle of the screen.
- 19 Adjust the BH TILT-1 through TILT-4 controls to adjust the corners.

When the Registration Adjustment is Complete

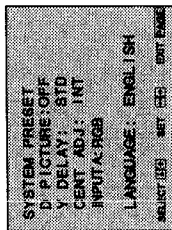
- 1 Set the R RAS, G RAS and B RAS switches to ON, and the BAR switch to BAR.
- 2 Press the TEST button on the control panel to return to the normal display.
- 3 Reinstall the top panel. (See page 17.)

SONY

VPH-V20MV20U
VPH-V22M

Supplement

3-885-312-11(1)



Note on the On-screen Display Language

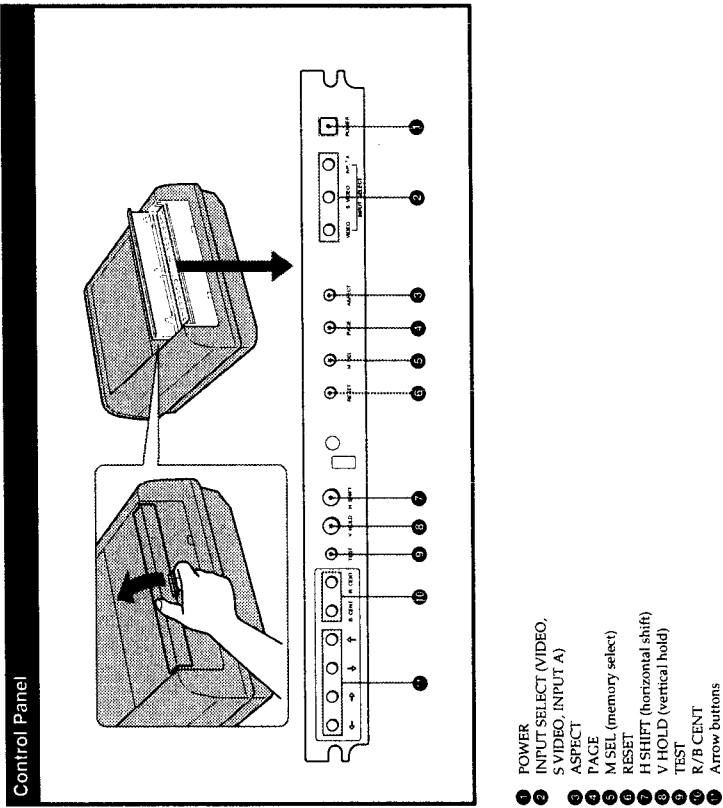
You may change the on-screen display language if you prefer German, French, Italian or Spanish. To change the language, follow the steps below.

- 1 Press the PAGE button repeatedly until the SYSTEM PRESET display appears. (See the figure above.)
- 2 Press the $\blacklozenge$ or $\blacklozenge$ button until LANGUAGE is highlighted in yellow.
- 3 Press the $\blacklozenge$ or $\blacklozenge$ button to choose the desired language. Each time you press the $\blacklozenge$ button, the language changes as follows:
ENGLISH→DEUTSCH→FRANCAIS→ITALIANO→ESPAÑOL
- 4 Pressing the $\blacklozenge$ button changes the language in reverse. Press the $\blacklozenge$ or $\blacklozenge$ button.
An on-screen display in the selected language appears.

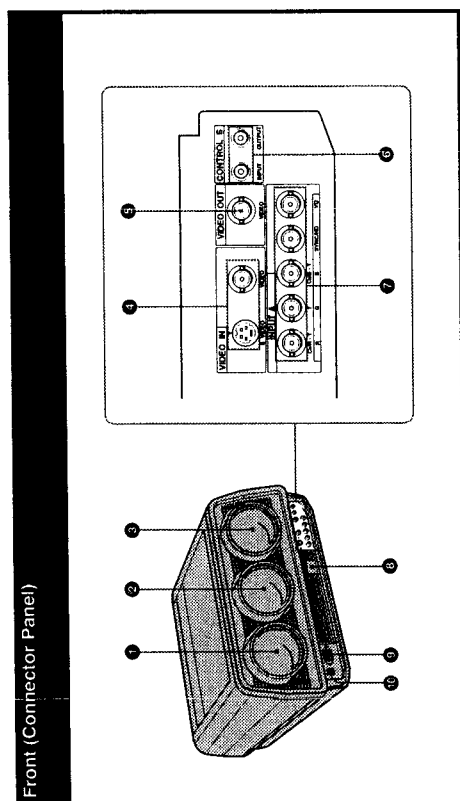
© 1998 by Sony Corporation

1-3. SUPPLEMENT

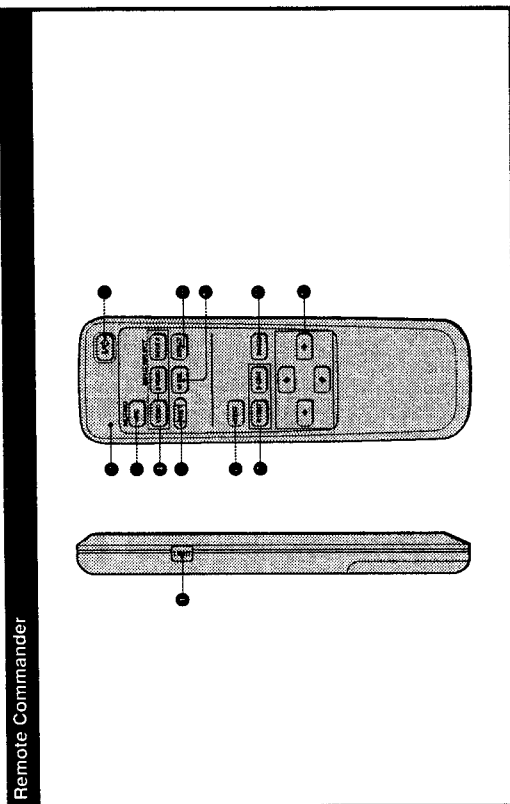
You can identify the buttons, controls and connectors on the projector in your language.



- 1 POWER
- 2 INPUT SELECT (VIDEO, S VIDEO, INPUT A)
- 3 ASPECT
- 4 PAGE
- 5 MSEL (memory select)
- 6 RESET
- 7 H SHIFT (horizontal shift)
- 8 V HOLD (vertical hold)
- 9 TEST
- 10 R/B CENT
- Arrow buttons



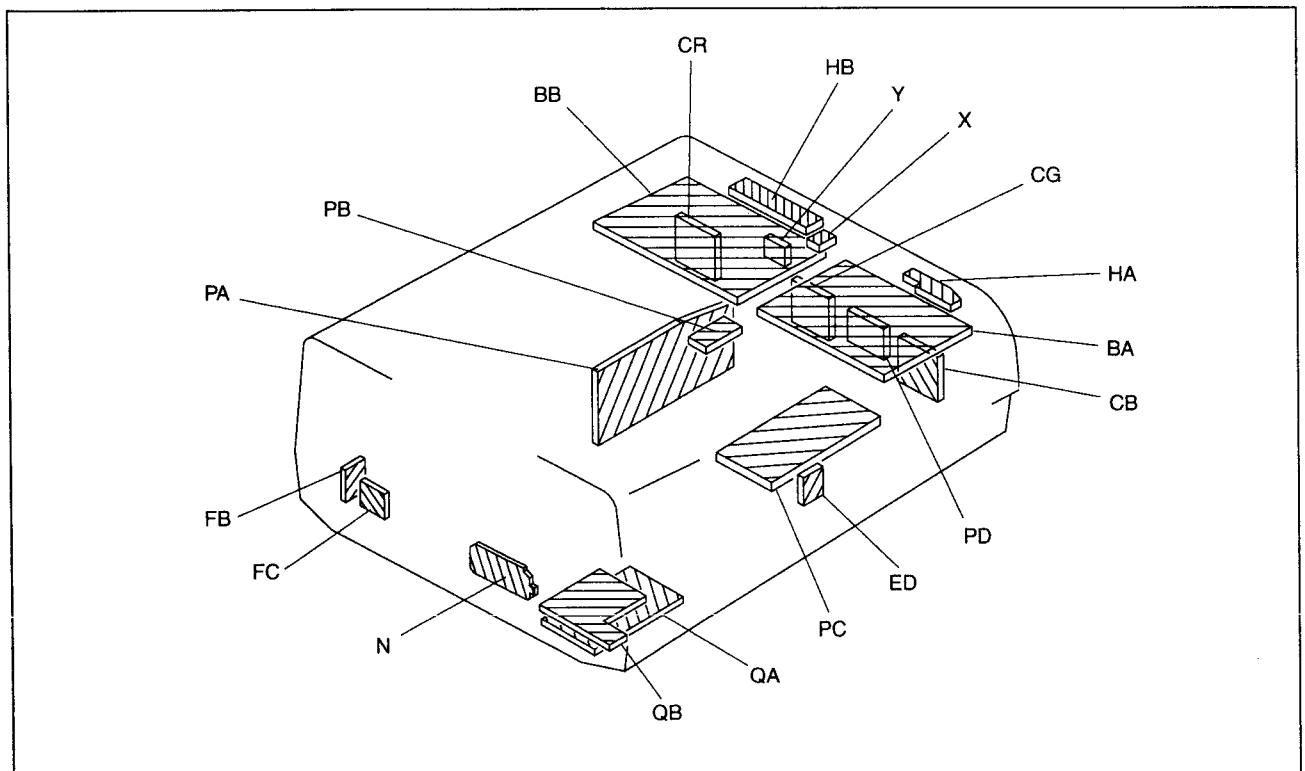
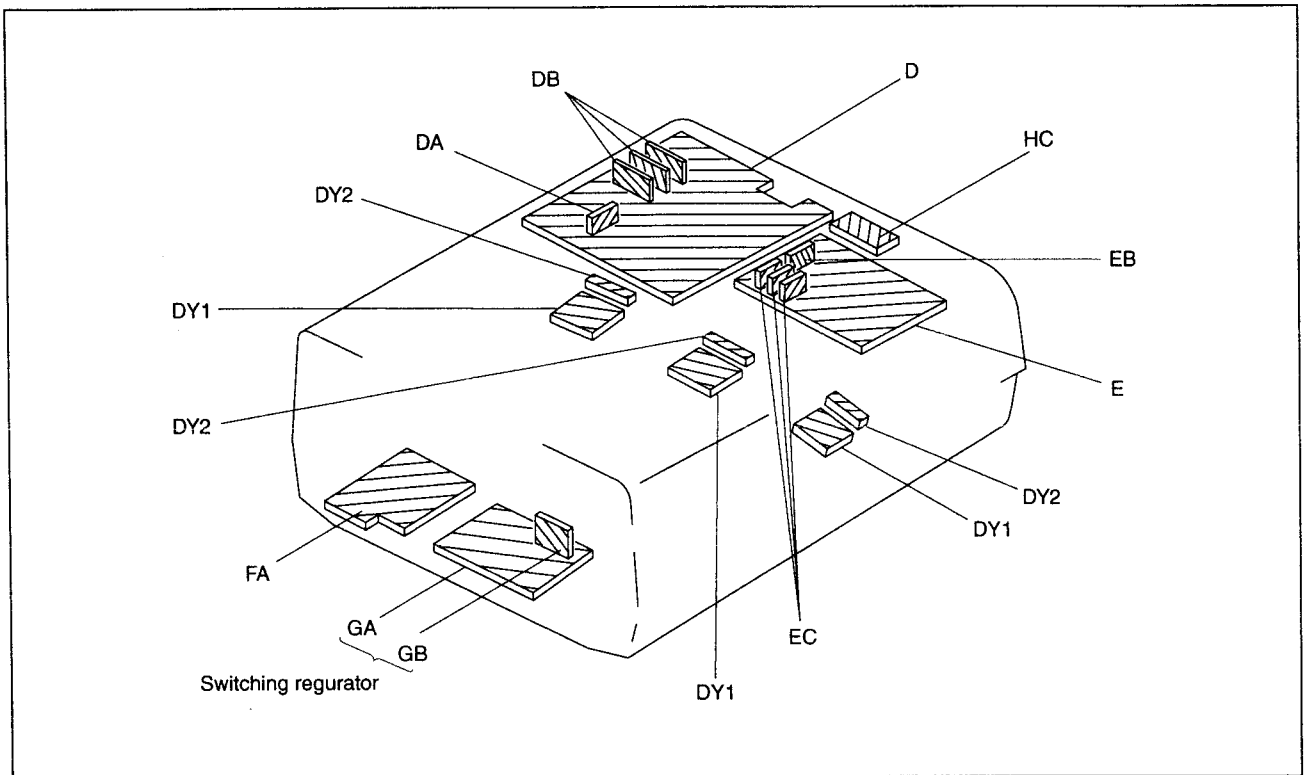
- 1 Red lens
- 2 Green lens
- 3 Blue lens
- 4 LINE IN (S VIDEO, VIDEO)
- 5 VIDEO OUT
- 6 CONTROL S INPUT/OUTPUT
- 7 INPUT A
- 8 Remote sensor
- 9 AC IN
- 10 MAIN POWER (ON/OFF)



- 1 LIGHT
- 2 Transmitter indicator
- 3 MUTING (PIC (picture))
- 4 INPUT SELECT
- 5 RESET
- 6 TEST
- 7 R/B CENT
- 8 I/O (on/standby)
- 9 ASPECT
- 10 M SEL (memory select)
- 11 PAGE
- 12 Arrow buttons

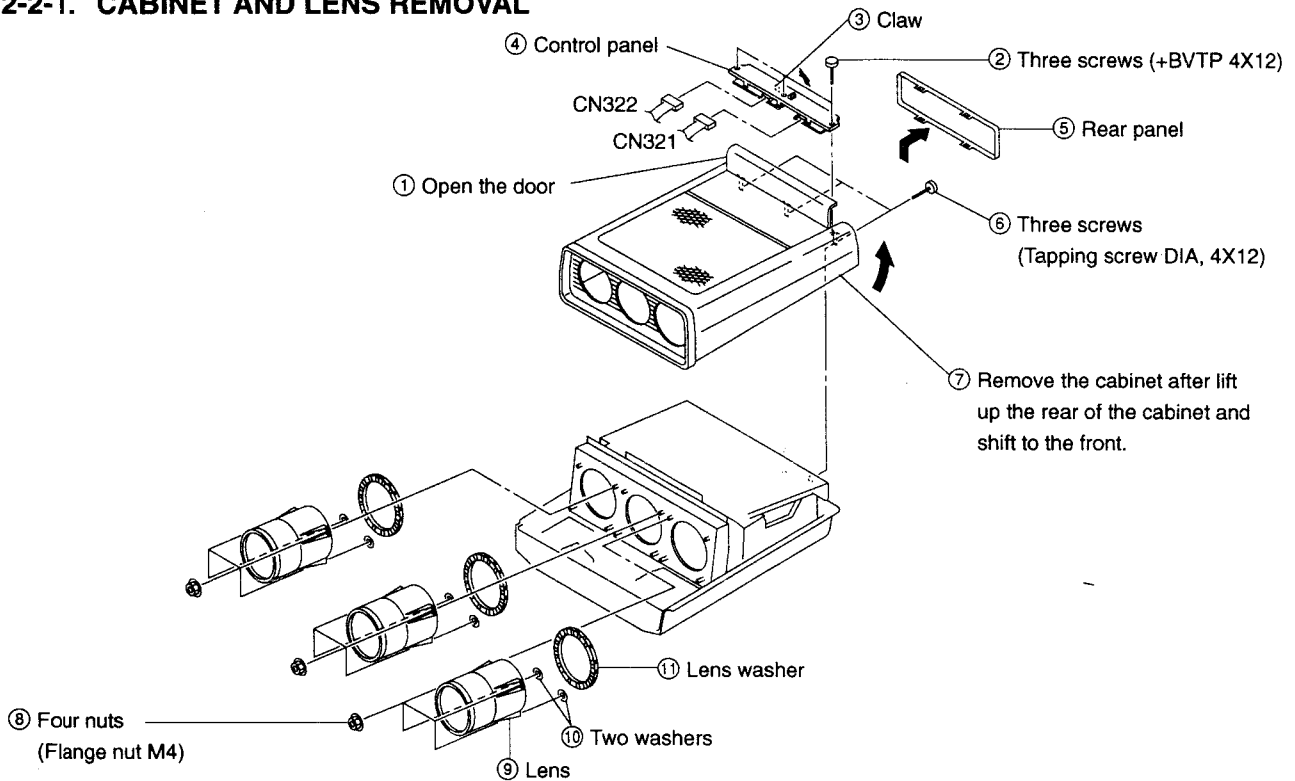
SECTION 2 SERVICE INFORMATION

2-1. CIRCUIT BOARDS LOCATION

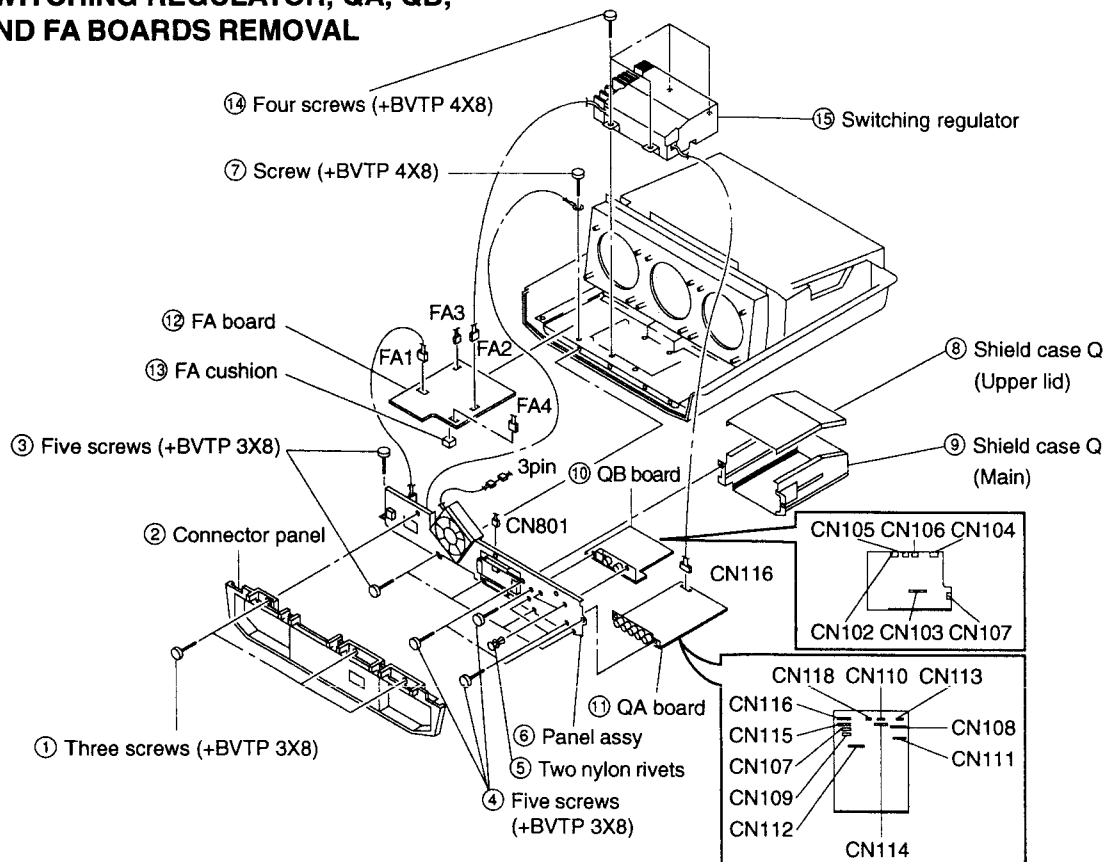


2-2. DISASSEMBLY

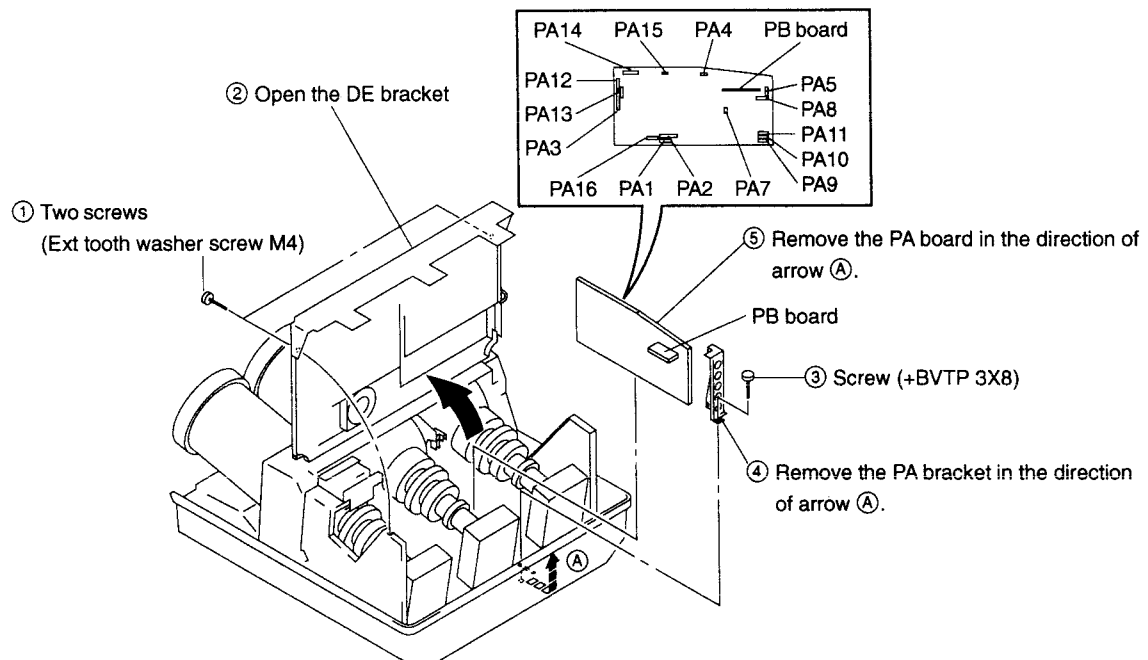
2-2-1. CABINET AND LENS REMOVAL



2-2-2. SWITCHING REGULATOR, QA, QB, AND FA BOARDS REMOVAL



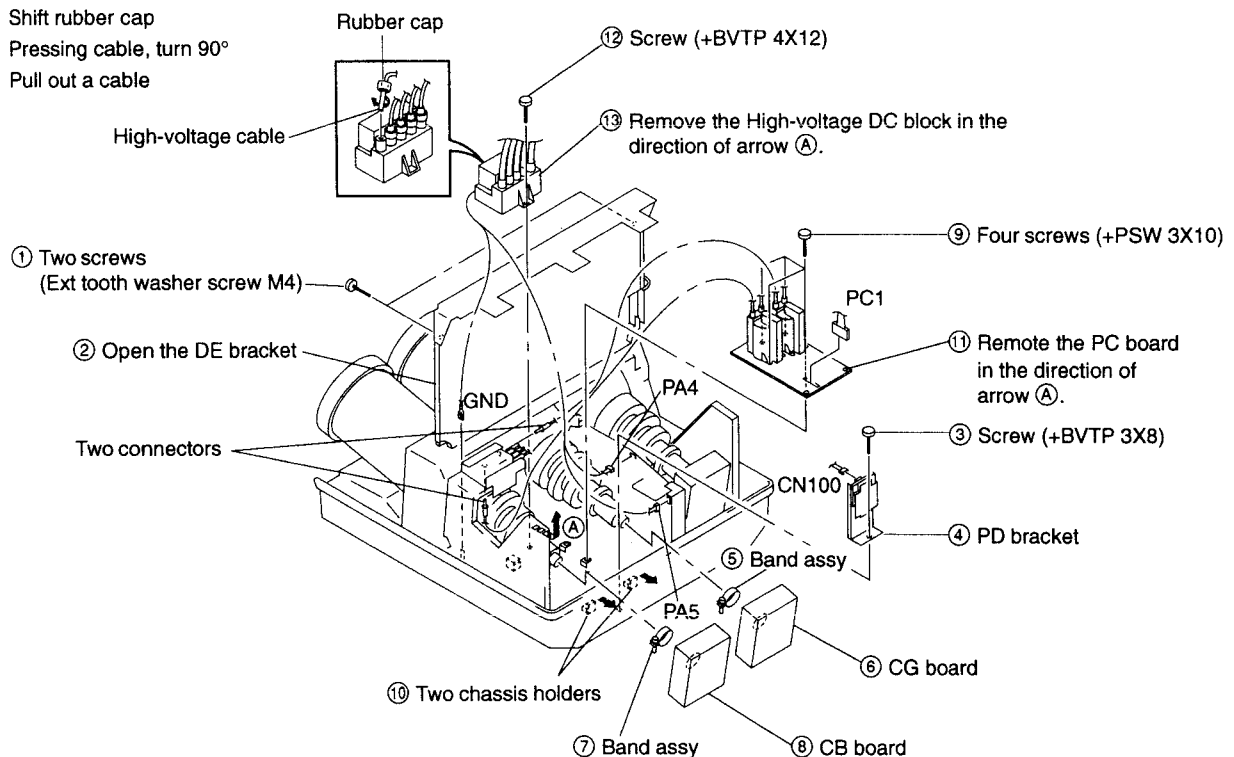
2-2-3. PA BOARD REMOVAL



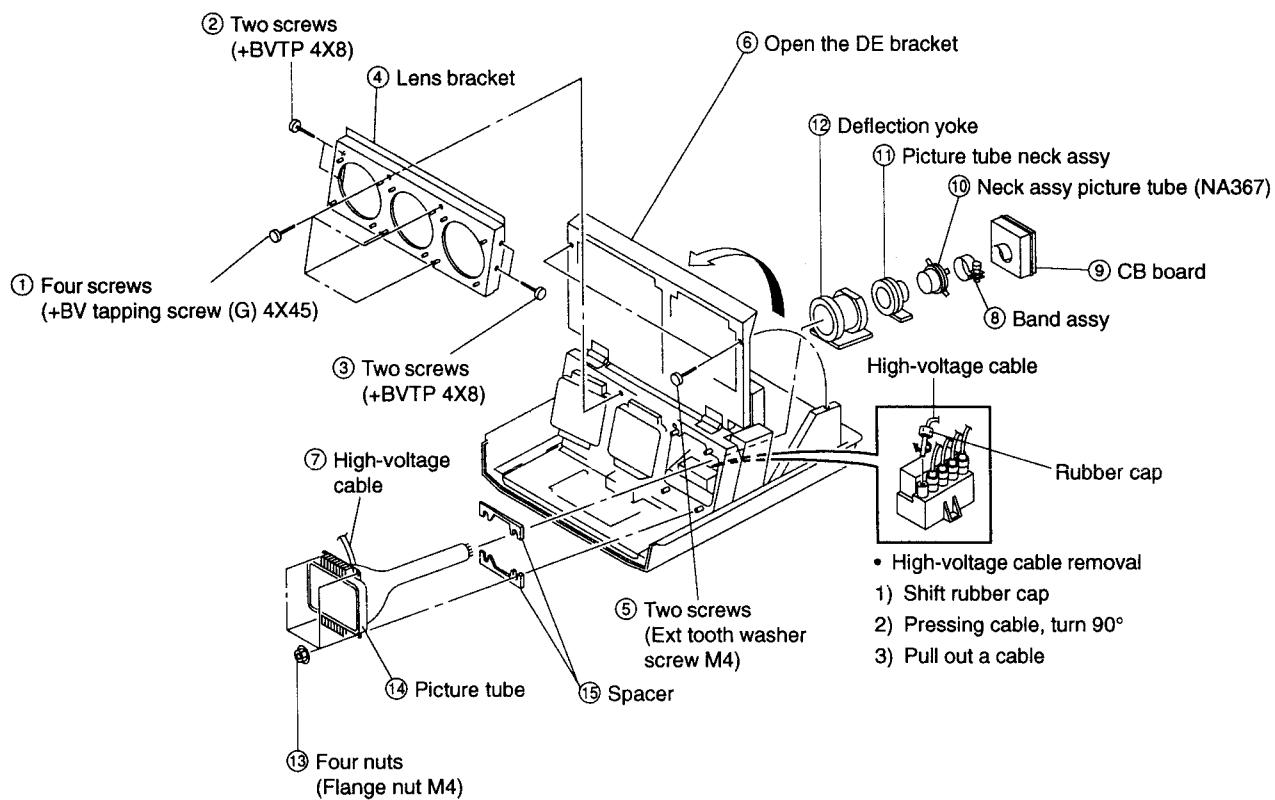
2-2-4. PC BOARD AND HIGH-VOLTAGE DC BLOCK REMOVAL

• High-voltage cable removal

- 1) Shift rubber cap
- 2) Pressing cable, turn 90°
- 3) Pull out a cable



2-2-5. PICTURE TUBE REMOVAL



SECTION3 SET-UP ADJUSTMENT

3-1. PROJECTION SYSTEM SETTING

- 1) Set the distance between the projector and screen as shown below.

Note : Distance between the screen

80" ————— 2681 mm $\pm$ 15mm

100" ————— 3301 mm $\pm$ 15mm

- 2) Set the height and angle of the screen as shown below.

Note : Height of screen

80" ————— 758 mm $\pm$ 5mm

100" ————— 890 mm $\pm$ 5mm

Degree of screen

0 degree $\pm$ 2 degree

- 3) Set the horizontal level of the screen.

Note : Horizontal level of the projector and screen

90 degrees $\pm$ 2 degree

- Lens must be pointed toward either east or west.

- 4) Place the projector on the adjustment table, and fix it.
(The adjustment table must be level.)

- 5) Connect the AC cord.

Note : Power source voltage

J ————— 100V (50Hz)

U/C ————— 120V (60Hz)

AEP ————— 220V (50Hz)

- 6) Connect the BNC to LINE IN.

Note : Video input signal ——— Monoscope video signal

Audio input signal ——— Single tone

- 7) Turn ON the MAIN POWER, and the POWER SW.

- 8) Press **[PAGE]** key of the B² remote control unit to enter the OSD display mode.

3-2. HORIZONTAL OSCILLATING FREQUENCY ADJUSTMENT

- 1) Receive NTSC monoscope signal.
- 2) Short the D board IC1 pin-1 and pin-11 and connect a frequency counter between IC1 pin-10 and ground.
- 3) Adjust the D board RV2 (H. HOLD LINE) to indicate within the standard value of the frequency counter.

Standard Value : 15734 Hz $\pm$ 50 Hz

- 4) Remove the short clip frequency counter.
 - 5) Input the monoscope VIDEO SIGNAL to the G terminal of R.G.B.
 - 6) Repeat the steps 2), 3), 4). Steps 3), however, adjust RV 1
- Note : Steps 5) and 6) are required only in the projector having R.G.B. input connectors.

3-3. SUB BRIGHTNESS ADJUSTMENT

- 1) Input NTSC cross-hatch signal.
- 2) Set the BRT to 50.
- 3) Connect an oscilloscope to the BB board TP9 and connect the ground to shield case.
- 4) Adjust the BB board SUB BRT VR (RV304) so that the black level of the video signal become $2.6V \pm 0.05V$ p-p.

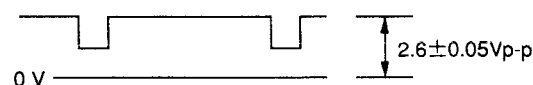


Fig. 1

3-4. GREEN FOCUS ADJUSTMENT

- 1) Put the lens caps on the RED and BLUE lenses.
- 2) Move the GREEN SUB lens to its most front position.
- 3) Rotate the MAIN lens for the optimum FOCUS on the screen.
- 4) Adjust the GREEN FOCUS VR of the focus pack for optimum focus on the screen.
- 5) Rotate the MAIN lens for the optimum focus at the center of the screen.
- 6) Rotate the SUB lens for the optimum focus at the corners of the screen. After adjustment, fix the GREEN SUB lens with the screw.
- 7) Rotate the MAIN lens again to adjust finely at the center of the screen and fix with the screw.

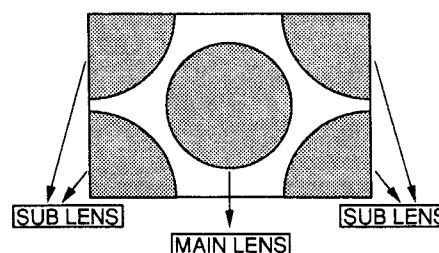


Fig. 2

3-5. RED FOCUS ADJUSTMENT

- 1) Put the lens caps on the GREEN and BLUE lenses.
- 2) Adjust the focus in the same manner as the previous section 3-4 GREEN FOCUS ADJUSTMENT.

3-6. BLUE FOCUS ADJUSTMENT

- 1) Put the lens caps on the RED and GREEN lenses.
- 2) Move the BLUE SUB lens to its most front position.
- 3) Rotate the main lens for the optimum focus on the screen.
- 4) Turn OFF the D board G. RAS and R. RAS switches to obtain the BLUE only.
- 5) Adjust the BLUE FOCUS VR of the focus pack to view the "+" crossing marks most clearly at the center of the monoscope screen. (Fig. 3)
(The center of the screen becomes most dark in this condition and become the just-focus picture.)

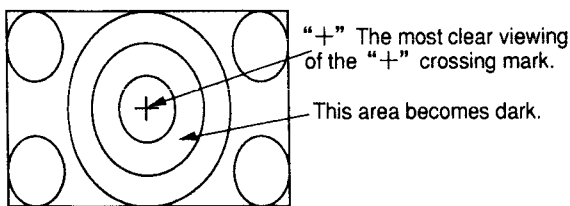


Fig. 3

- 6) Turn the VR clockwise slowly and the horizontal black stripes appear and Blank Stripes move vertically. (Fig. 4)

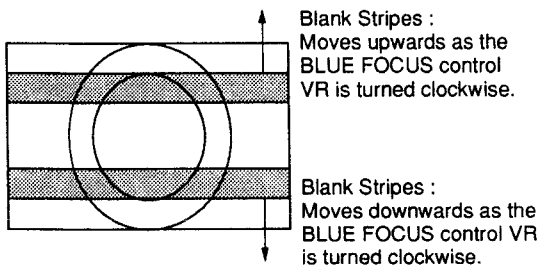


Fig. 4

- 7) Adjust the VR so that the upper-most one column becomes uniformly dark. (Fig. 5)

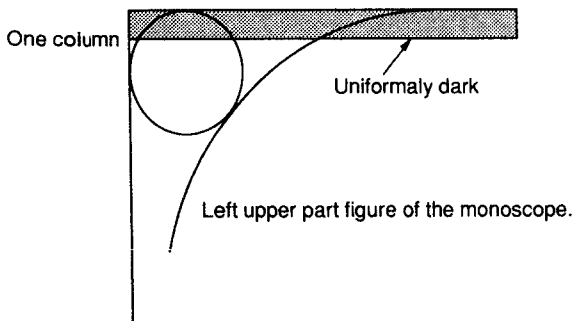


Fig. 5

- 8) Rotate the MAIN lens for the optimum focus at the center of the screen.
- 9) Rotate the SUB lens for the optimum focus at the corners of the screen. After adjustment, fix the lens with the screw.
- 10) Rotate the MAIN lens again to adjust finely at the center of the screen and fix with the screw.

3-7. HATCH SWITCH OPERATION CONFIRMATION

- 1) Press the TEST SW, and confirm that the monoscope signal and cross-bars signal appear alternately.
- 2) Set the D board HATCH SW [S8] to the HATCH position, and confirm that the cross-hatch signal appears.

3-8. RED AND BLUE H. CENT AND V.CENT OPERATION CONFIRMATION

- 1) Press the HA board R. CENT, and display the cross-bars signal on the screen.
- 2) Press the   keys, and confirm that the RED horizontal bar moves from minimum to maximum.
- 3) Press the   keys, and confirm that the red vertical bar moves from minimum to maximum.
- 4) Press the B. CENT, and display the cross-bars signal on the screen.
- 5) Repeat the steps 2) and 3).
- 6) RESET the switches.

3-9. CONFIRMATION OF CENT ADJUSTMENT USING EXTERNAL SIGNAL

Note : Input the monoscope video signal to the VIDEO IN.

- 1) Establish the SYSTEM PRESET using the  key.
- 2) Select [CENT ADJ] using  key, and select [EXT] using  key.
- 3) Press first the HA board R. CENT, and then press   keys. Check that RED horizontal bar moves from minimum to maximum.
(The monoscope signal will have registration error.)
- 4) Press   keys, and confirm that RED vertical bar moves from minimum to maximum.
- 5) Press B. CENT, and repeat steps 3) and 4).
- 6) Change the [CENT ADJ] to [INT] using  key.

3-10. GREEN PICTURE ADJUSTMENT

- 1) Confirm the switching of the DA board S1 – S7.

Note : S1 – S5 ——— NORMAL

S6 ——— 100

S7 ——— NORMAL

(Switches S6 to 200/72 when use 80 inches.)

- 2) Set all the registration adjustment VRs on the D board to their mechanical centers.

- 3) Set the user's R. CENT and B. CENT to 000.

Note : Procedure to set the R. CENT and B. CENT to 000.

Using the B² remote control unit, press the keys in the following sequence.

R. CENT → RESET → B. CENT →

RESET → B. CENT

- 4) Receive the monoscope video input signal.
- 5) Loosen the DY fixing screw and adjust the DY so that the horizontal center line of the monoscope signal and the horizontal lines of the screen are parallel. Then tighten the rotate screw temporarily.
- 6) Loosen the Neck Assembly fixing screw and rotate the neck so that the center line of the DY agrees with the center line of the GREEN neck assembly. Then tighten the rotate screw temporarily.
- 7) Rotate the D board H. CENT G [RV 10] and V. CENT G [RV 5] so that the center of the monoscope signal agrees with the center of the screen.
- 8) Repeat steps 5) and 6). When positions are correctly set, tighten the screws.
- 9) Set the D board HATCH SW to HATCH position.
- 10) Set the BRIGHT to its mechanical center and set the PICTURE to its maximum.
- 11) Turn slightly the FOCUS VR of the focus pack counter-clockwise from the just point to display halation around the hatch luminescent line.
- 12) Adjust the two-pole magnet so that amount of halation is equal in the right, left, up and down. (Fig. 6)

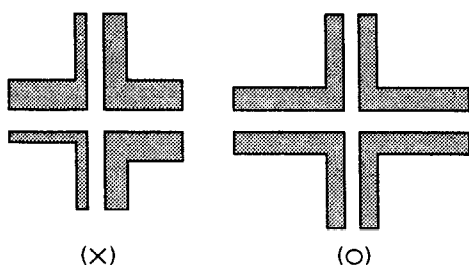


Fig. 6

- 13) Set the D board HATCH/DOT [S9] to DOT position.

- 14) Turn slightly the FOCUS VR of the focus pack clockwise from the just point for easier viewing of dot shape.

- 15) Adjust the four-pole magnet so that the DOT shape is accurately round. (Fig. 7)

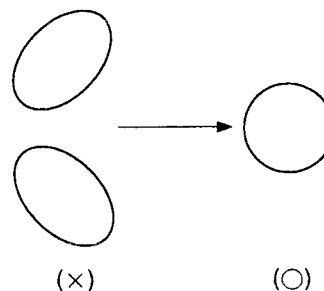


Fig. 7

- 16) Repeat the two-pole magnet and four-pole magnet adjustments again and fix then with white paint after adjust.

- 17) Adjust the D board MAIN H. SIZE [RV11], V. SIZE [RV6] and V. LIN G [RV7] for coarse adjustment of vertical and horizontal sizes.

Note : NTSC monoscope signal

H. SIZE ——— 16.0 columns

V. SIZE ——— 12.0 rows

- 18) Adjust the D board PIN CENT [RV4] until the horizontal center line does not move even though the MAIN V. PIN [RV9] is rotated from 0 % to 100 %.

Note: After adjustment, never adjust PIN CENT [RV4].

- 19) Adjust the D board MAIN V. PIN [RV9] so that the horizontal lines in top and bottom of the monoscope signal are parallel with the screen display.

- 20) Adjust the D board V. BOW G [RV8] so that the horizontal center line of the monoscope signal and that of the screen are parallel. Adjust V. CENT G [RV5] again to agree both horizontal centerline.

- 21) Adjust the D board V. LIN G [RV7] so that the numbers of columns of the monoscope signal are equal above and below the horizontal center line.

Adjust the D board V. SIZE G [RV6] for 12.0 rows of the monoscope signal.

Adjust the MAIN V. PIN [RV9] so that the both horizontal lines of the monoscope signal are parallel with the screen frame.

Adjust the D board H. SKEW G [RV13] and H. CENT G [RV10] so that the vertical center line of the monoscope signal agrees with the vertical center line of the screen.

Adjust the D board MAIN H. PIN [RV15] so that the

vertical lines in the left and right of the monoscope signal are parallel with the screen frame.

Adjust the D board MAIN H. SIZE [RV11] for 8.0 columns on the right and left sides of the vertical center line respectively of the monoscope signal.

3-11. BLK CONFIRMATION

- 1) Select the VIDEO mode, and receive the NTSC monoscope signal.
- 2) Switches the BB board SW201.
- 3) Check that the amount of blanking is equal in the right, left, top and bottom of screen.

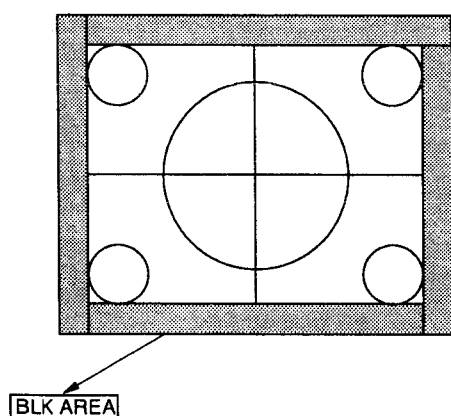


Fig. 8

3-12. RED DY ADJUSTMENT

- 1) Set the D board BLUE RAS SW [S10] to OFF to display RED and GREEN.
- 2) Adjust the D board V. CENT R [RV16], V. LIN R [RV18], H. CENT R [RV25] and H. LIN R [RV27] so that the center of the RED monoscope agrees with the GREEN monoscope center.
- 3) Establish the TEST mode.
- 4) Adjust the D board V. BOW R [RV20] so that the horizontal center line of RED becomes straight.
- 5) Loosen the RED DY screw and rotate the RED DY so that the horizontal center line of the RED monoscope is parallel with the GREEN then tighten the screw.
- 6) Loosen the RED neck assembly fixing screw and rotate the neck so that the center line of the DY agrees with the center line then tighten the screw.
- 7) Perform the two-pole magnet and four-pole magnet adjustments in the same manner as section 3-10 GREEN PICTURE ADJUSTMENT.

3-13. BLUE DY ADJUSTMENT

- 1) Set the D board RED RAS SW [S12] to OFF to display BLUE and GREEN.
- 2) Adjust the D board V. CENT B [RV34], H. CENT B [RV43], V. LIN B [RV36] and H. LIN B [RV45] so that center of the monoscope agrees with the GREEN monoscope center.
- 3) Establish the TEST mode.
- 4) Adjust the D board V. BOW B [RV38] so that the horizontal center line of BLUE becomes straight.
- 5) Loosen the BLUE DY screw and rotate the DY so that the horizontal center line of the BLUE monoscope is parallel with GREEN then, tighten the screw.
- 6) Loosen the BLUE neck assembly fixing screw and rotate the neck so that the center line of the DY agrees with the center line of the BLUE neck assembly then tighten the screw.
- 7) Perform the two-pole magnet and four-pole magnet adjustments in the same manner as step 8) through step 16) of section 3-10 GREEN PICTURE ADJUSTMENT.

3-14. GREEN-RED VERTICAL REGISTRATION ADJUSTMENT

- 1) Establish the TEST mode.
- 2) Set the D board HATCH SW [S8] to cross HATCH position.
- 3) Set the D board BLUE RAS SW [S10] only to OFF to display RED and GREEN.
- 4) Adjust the D board V. CENT R [RV16], V. SKEW R [RV19] and V. BOW R [RV20] so that horizontal center line of the RED monoscope agrees with that of GREEN horizontal center line.
- 5) Adjust the D board V. SIZE R [RV17] and V. LIN R [RV18] so that centers of the RED horizontal lines agree with those of GREEN in both top and bottom ends of the screen.

3-15. TILT ADJUSTMENT

- 1) Adjust the D board [RV21] through [RV24] RED V. TILT 1 - 4 for the maximum tilt correction.

Note :RV21 ——— 0%
RV22 ——— 100%
RV23 ——— 0%
RV24 ——— 100%

- 2) Set the projector to NORMAL mode.
- 3) Receive the uniform white signal.

- 4) Adjust the D board KEYS CENT VR [RV3] so that RED and GREEN retrace lines become invisible on the horizontal center line of the screen.

Note :After completed KEYS CENT adjustment, never move this VR hear after.

- 5) Adjust the D board [RV21] through [RV24] (V. TILT VR) to their mechanical center.

3-16. GREEN-RED HORIZONTAL REGISTRATION ADJUSTMENT

- 1) Establish the TEST mode.
- 2) Adjust the D board H. BOW R [RV 29] so that the vertical center line of the RED monoscope becomes straight.
- 3) Adjust the D board H. SKEW R [RV 28] so that the vertical center line of the RED monoscope is parallel with that of GREEN vertical center line.
- 4) Adjust the D board H. CENT R [RV 25] so that the vertical center lines of RED and GREEN agree.
- 5) Adjust the E board H. SIZE R [L6] and the D board H. LIN R [RV 27] so that centers of the RED vertical lines agree with those of GREEN in both right and left ends of the screen.

3-17. GREEN-RED TILT ADJUSTMENT

- 1) Set the D board BLUE RAS SW [S10] to OFF to display RED and GREEN.
- 2) Adjust the D board [RV21] through [RV24] RED V. TILT VR so that the RED horizontal lines agree with those of GREEN at the corners of the screen.
- 3) Adjust the D board [RV30] through [RV33] RED H. TILT VR so that the RED vertical lines agree with those of GREEN at the corners of the screen.

3-18. GREEN-BLUE VERTICAL REGISTRATION ADJUSTMENT

- 1) Establish the TEST mode.
- 2) Adjust the D board V. CENT B [RV34], V. SKEW B [RV37] and V. BOW B [RV 38] so that horizontal center line of the BLUE monoscope agrees with that of GREEN horizontal center line.
- 3) Adjust the D board V. SIZE B [RV35] and V. LIN B [RV36] so that centers of the BLUE horizontal lines agree with those of GREEN in both top and bottom ends of the screen.

3-19. GREEN-BLUE HORIZONTAL REGISTRATION ADJUSTMENT

- 1) Adjust the D board H. BOW B [RV 47] so that the vertical center line of the BLUE monoscope becomes straight.
- 2) Adjust the D board RV37 (H. SKEW B) so that the vertical center line of the BLUE monoscope is parallel with that of GREEN vertical center line.
- 3) Adjust the D board H. CENT B [RV 43] so that the vertical center lines of BLUE and GREEN agree.
- 4) Adjust the E board H. SIZE B [L8] and the D board H. LIN B [RV 45] so that centers of the BLUE vertical lines agree with those of GREEN in both right and left ends of the screen.

3-20. GREEN-BLUE TILT ADJUSTMENT

- 1) Adjust the D board [RV39] through [RV42] BLUE V. TILT VR so that the BLUE horizontal lines agree with those of GREEN at the corners of the screen.
- 2) Adjust the D board [RV48] through [RV51] H. TILT VR so that the BLUE vertical lines agree with those of GREEN at the corners of the screen.

3-21. 16:9 ASPECT RATIO CONFIRMATION

- 1) Input the monoscope signal.
- 2) Press **ASPECT** key of the remote control unit to switch the aspect ratio between 4:3 picture and 16:9 picture.

Note :Size of the display must have the aspect ratio as shown in below.

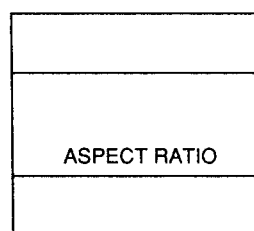


Fig. 9

3-22. WHITE BALANCE ADJUSTMENT

- 1) Rotate the BB board G. DRIVE VR [RV2] and B. DRIVE VR [RV3] to 100 % positions as viewed from the component side and rotate R. DRIVE VR [RV 1] to about 80 % positions .

Note : Color temperature of white balance adjustment

• 6500° K 8 MPCD

[This value is based on white board so it will show slightly BLUE on screen.]

- 2) Measure the connector pin-5 then adjust the BB board R DRIVE VR [RV1] with viewing the waveform of CR4 connector pin-5 to the amplitude value to must be 0.6 times.

(If the R DRIVE VR [RV1] is adjusted, the GREEN signal amplitude changes and as they interacts each other, repeat the RED signal adjustment and GREEN signal measurement until they stabilize.)

- 3) Input the NTSC uniform white video signal.
- 4) Set the focus pack G2 VR, CONTRAST and BRIGHT adjustments to their centers.
(To set the CONTRAST and BRIGHT adjustments to their centers, use the B² remote control, and press **SWITCHER 4** key.)

- 5) Adjust the G2 VR to the point where 20 IRE is cut-off, and 30 IRE dimly illuminates.

- 6) Set the BRIGHT to the minimum.

To set the BRIGHT adjustment to the minimum, use the B2 remote control, and press **SWITCHER 1** key and then **BRT-** key.

- 7) Press the B² remote control **SWITCHER 3** key to establish the OSD OFF mode.

- 8) Adjust the RED G2 and BLUE G2 VR adjustments to adjust the white balance at cut-off.

- 9) Set the CONTRAST and BRIGHT controls to the maximum.

To set the CONTRAST and BRIGHT adjustments to the maximum, press the B² remote control **SWITCHER 1** key and then **CONTR+** key, and also press **SWITCHER 1** key and then **BRT+** key

- 10) Adjust the BB board R. DRIVE VR [RV1] so that the GREEN LED of the adjustment tool turns on.

- 11) Set the CONTRAST BRT and BRIGHT controls to the minimum.

To set the CONTRAST BRT and BRIGHT adjustments to the minimum, press the B² remote control

SWITCHER 1 key and then **CONTR-** key, and

also press **SWITCHER 1** key and then **BRT-** key

- 12) Repeat above steps 8) through 11) until white balance is established.

- 13) When the white balance adjustment is completed, press the B² remote control **PAGE** key to cancel the OSD OFF mode.

SECTION 4

SAFETY RELATED ADJUSTMENT

4-1. PA AND PC BOARDS ADJUSTMENT

If the parts described below are replaced, check the HV Hold-Down circuit, High Tension Voltage Regulator circuit, Beam Current Protection circuit and O.V.P circuit.

- ☒ R38, RV1 HV Hold-Down
- ☑ R15, R35, R36, R37, R38, RV1, R40, R41, R42, R43, R44, C30, D16, D22, Q10, IC2, Mounted PA board
- ☒ R48, RV2 High Tension Voltage Regulation
- ☑ R31, R32, R33, R34, R46, R47, R48, RV2, R82, R83, R84, C3, C39, C56, L2, D17, Q14, IC1, Mounted PA board
- R3, R4, R7, R14, IC1, Mounted PB board
- ☑ R23 Beam Current Protection circuit
- ☑ R16, R18, R19, R20, R21, R22, R23, R50, R51, R52, R53, R69, D15, D20, Q9, Q11, Q12, IC3, Mounted PA board
- ☒ R88, R89 O.V.P circuit check
- ☑ R18, R85, R86, R87, R88, R89, IC1, D18, Mounted PA board
- Others HVR, FBT1, FBT2, L1, L2, C1, C2

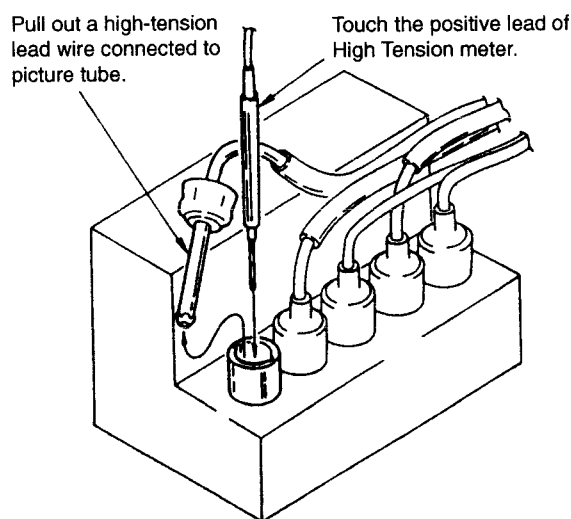
[±15V Line Confirmation]

- (1) Connect the negative “-” side of a digital voltmeter to the pin ⑧ of the E-8 connector on the E board, and the positive “+” side to the pin ①.
- (2) Set the input supply voltage.

Input voltage	Voltage changer
J 100V	120V side
U/C 120V	120V side
AEP 220V	240V side
- (3) Check that “+15V” is within the specification.
Standard: $+15.5 \pm 1$ VDC
- (4) Connect the positive “+” terminal of the digital voltmeter to the pin ③ of the E-8 connector.
- (5) Check that “-15V” is within the specification.
Standard: -15.5 ± 1 VDC

[Connect the High Tension Voltmeter]

- (1) Check that the power switch of the projector is turned “OFF”.
- (2) Remove the red colored anode lead from the dc high tension block. Connect the “+” lead of a high tension voltmeter to the dc high tension block. Connect the “-” lead of a high tension voltmeter to chassis-GND of CRT.



☒ R38, RV1 HV Hold-Down Adjustment

- (1) Keep pressing the “↑” of the B remote controller for more than 5 seconds, and then keep pressing the “→” for more than 5 seconds to enter the serviceman mode. When the “↑” is pressed, “Not applicable” will appear in the lower left corner of the screen. Keep pressing the “↑,” and “Not applicable” will disappear. It will take approx. 5 seconds until the message appears again.
- (2) Receive the color bar and set the PICTURE in the MAX position. Turn the G2 VR (R, G) to the maximum extent until the fly-back line is about to appear. To set the PICTURE in the MAX position, press “SWITCHER1” → “CONTR+” with the B² remote controller. Turn the focus VRs for R, G, and B counterclockwise, respectively, to the maximum extent.
- (3) Turn RV1 counterclockwise to the maximum extent, and set the PROT in the direction of cancellation.
- (4) Turn RV2 clockwise, and set the high voltage to 34kV. Turn off the MAIN SW right after the high-voltage PROT is activated. Wait for 10 seconds before turning the SW on.
Standard: 34.0 ± 0.3 kV

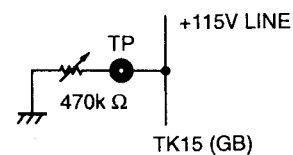
- (5) Turn RV1 clockwise, and stop it when the high voltage drops.
- (6) Turn off the POWER to the SET, and turn RV2 counterclockwise to the maximum extent.
- (7) Turn on the POWER to the SET again.
- (8) Turn RV2 clockwise, and check that the high voltage drops at 34.0 kV. If it is out of the standard range, repeat operation from (3).
Standard: 34.0 ± 0.3 kV
- (9) When the high voltage is within the standard range, turn off the POWER to the SET, attach the specified VR cap, and secure RV1 with RTV.

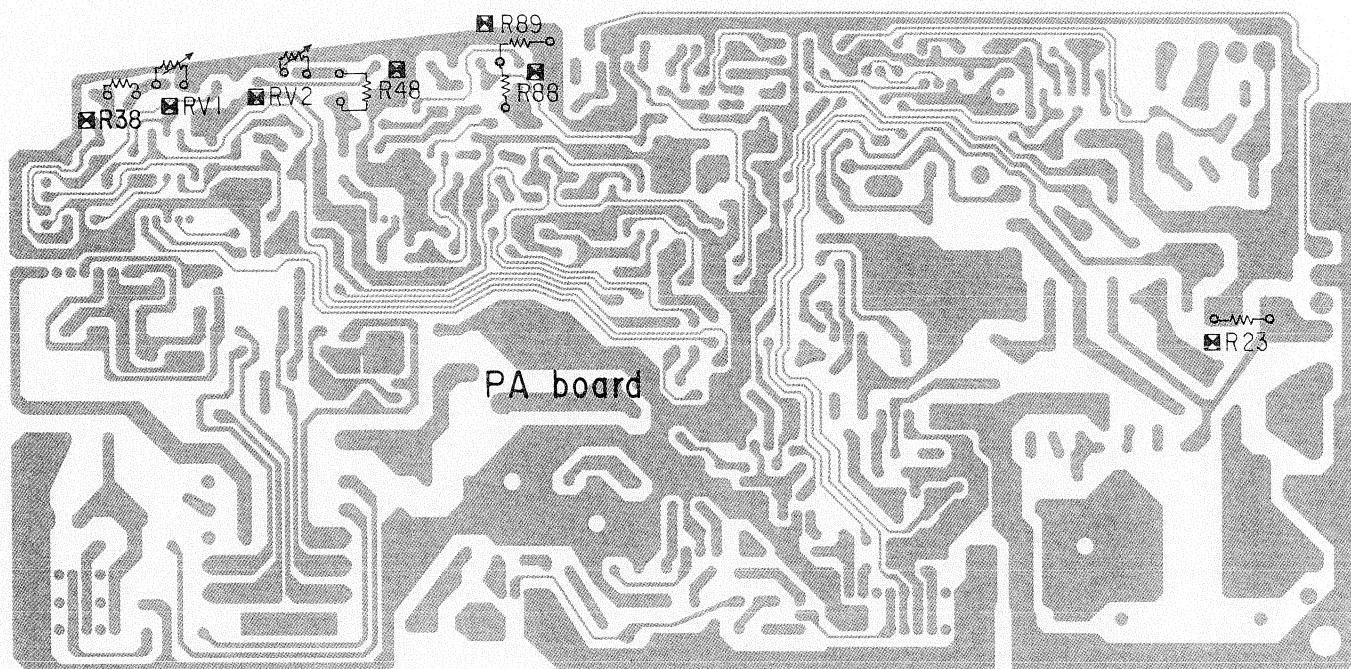
[R48, RV2 High Tension Voltage Regulator Adjustment]

- (1) Turn RV2 counterclockwise to the maximum extent, and turn on the POWER.
- (2) Turn PIC, BRT, and G2 to cut them off.
- (3) Turn RV2 clockwise so that the high voltage will be 33.0 kV.
Standard: $33.0 \pm_{-0.3}^{+0.2}$ kV
- (4) Receive a monoscope signal.
- (5) Change the PIC and BRT from MIN to MAX to check that the width of HV change is within the standard range.
Standard: $33.0 \pm_{-0.55}^{+0.2}$ kV
To set the PIC to MIN, press "SWITCHER1" → "CONTR-" with the B² remote controller. To set the BRT to MIN, press "SWITCHER1" → "BRT-" with the B² remote controller.
- (6) Turn off the POWER to the SET, attach the specified VR cap, and secure RV2 with RTV.

[R88, R89 OVP Adjustment]

- (1) Input a monoscope signal.
- (2) Connect an appropriate resistor or VR to R88 and R89 on the PA board.
It is recommended to connect a 22 k Ω resistor to R88 and a 5 k Ω VR to R89.
- (3) Connect a 470 k Ω VR between the TP and GND on the GB board inside TK-15 (power unit).
Keep the VR in the MAX state.
- (4) Connect a digital voltmeter between the +115V line and GND.
- (5) Turn on the POWER SW, and gradually turn the 470 k Ω VR until the digital voltmeter reading becomes 124V.
Standard: 124 ± 1 VDC
- (6) Select the resistors R88 and R89 on the PA board, and check that the OVP is activated at 124V and that the high voltage drops.
Standard: 124 ± 1 VDC
* When the high voltage drops upon activation of the OVP, turn off the POWER SW immediately.
- (7) Turn the resistor R88 selected in procedure (6) around the section between TP7 and TP8 and the resistor R89 around the section between TP8 and TP9, and solder them, respectively.
- (8) Return the 470 k Ω VR to the MAX state, and turn ON the POWER again.
- (9) Gradually turn the 470 k Ω VR, and check that the OVP is activated at 124V.
Standard: 124 ± 1 VDC
- (10) Turn off the POWER SW, and remove the VR and digital voltmeter.





[R23 Beam Current Protector Adjustment]

* When the beam current protector is activated and the high voltage has dropped, turn off the MAIN SW immediately.

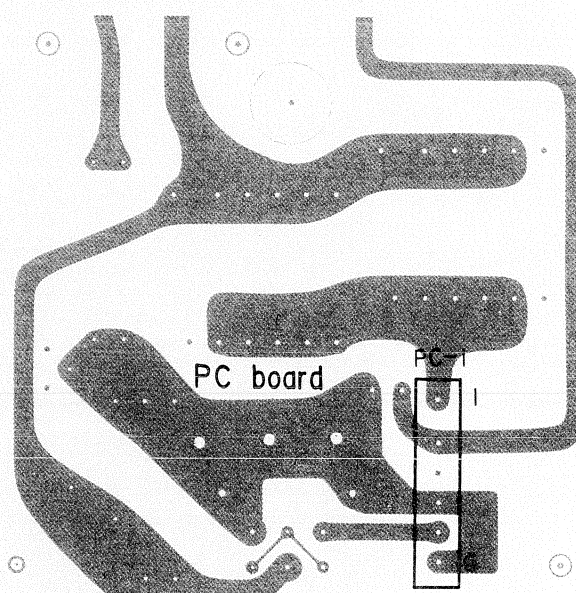
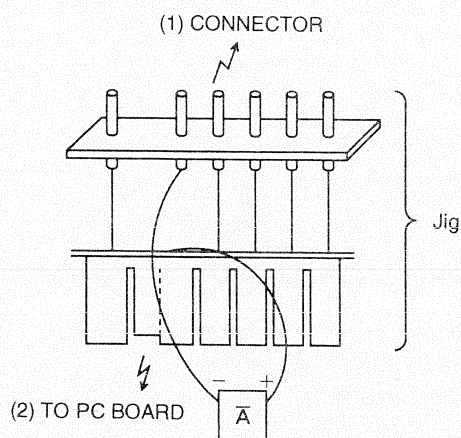
- (1) Connect a DC ammeter to the pin ② (ABL) line of the PC-1 connector on the PC board.
- (2) Turn on all R, G, and B RASTER SWs (S10, S11, and S12) on the D board.
- (3) Short-circuit the section between base and emitter of Q12 on the PA board.
- (4) Input a VIDEO monoscope signal, and turn on the POWER SW.
- (5) Set the PIC BRT in the MAX position.

To set the PIC (BRT) in the MAX position, press **[SWITCHER1]** → **[CONTR+]** (**[BRT+]**) with the B² remote controller.

- (6) Gradually turn the G2 VR, and check that the current right before the beam current protector is activated is within the standard range.

Beam current protector operating current
Standard : 3.5 mA or less.

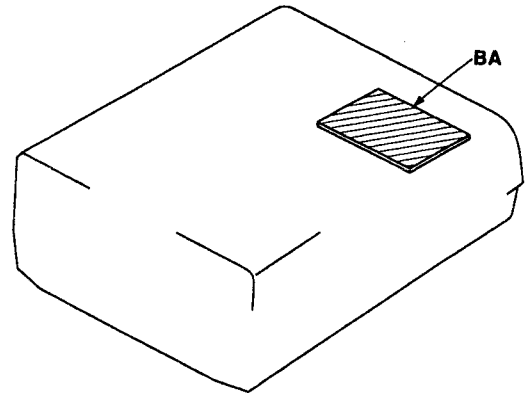
- (7) Turn off the POWER SW.
- (8) Remove the short bar from the section between base and emitter of Q12 on the PA board, and short-circuit the section between base and emitter of Q11.
- (9) Lower the G2 slightly, and then turn on the POWER SW.
- (10) Make confirmation in the same way as procedure (6).
The standard is the same as that in procedure (6).



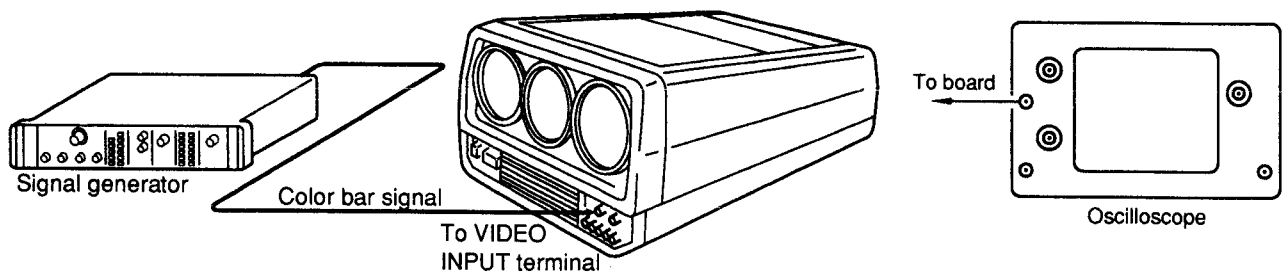
SECTION 5 CIRCUIT ADJUSTMENT

Note :

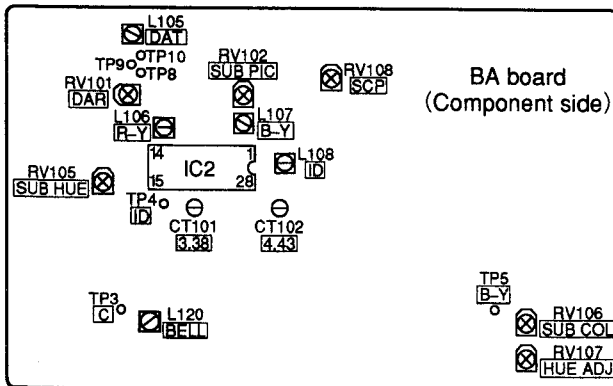
Fit DY (deflection yoke) tightly to picture tube when conducting basic adjustment, electric adjustment or exchanging picture tube.



CONNECTION



5-1. BA BOARD ADJUSTMENT



INITIAL SETUP

CN206	pin-4	SHARP	} Reset (4.5V)
	pin-3	HUE	
	pin-2	COL	
	pin-1	DP OFF (5V)	
CN203	pin-1	Connect 10kΩ and apply 5V.	
CN201	pin-3	-15V	
	pin-1	+15V	
	pin-2	GND	
CN205	pin-4	H. BLK PULSE (12Vp-p)	
	pin-5	CLAMP PULSE (2Vp-p)	
CN207	pin-7	Connect 10kΩ and apply 5V	

REF. OSC Adjustment (CT101, CT102)

1. Input PAL color bar.
2. Adjust CT102 so that the display becomes colored.
3. Set PAL forced MODE.

Note. 1 : PAL forced MODE signify to apply +12V to IC2 pin-28 through 3.3KΩ in this case.

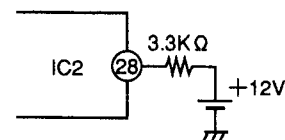


Fig. 1

4. Ground IC2 pin -17 and turn color-killer OFF.
5. Adjust CT102 until CRT screen move become slowly as possible.
6. Release the PAL forced MODE.
7. Disconnect IC2 pin-17 grounding.
8. Input NTSC3.58 color bar.
9. Adjust CT101 so that the display becomes colored.
10. Set to NTSC 3.58 forced MODE.

Note. 2 : NTSC forced MODE signify to apply +12V to IC2 pin-26 through 3.3KΩ in this case.

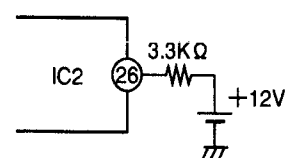


Fig. 2

11. Ground IC2 pin-17 and turn color-killer OFF.
12. Adjust CT101 until CRT screen move slowly as possible.
13. Release the NTSC 3.58 forced MODE.
14. Disconnect IC2 pin-17 grounding.

1H DELAY LINE Adjustment (L105, RV101)

1. Input PAL color bar.
2. Set to PAL forced MODE.
3. Connect oscilloscope to TP-5 and view the waveform of H block.
4. Adjust L105 and minimize the double outlines of waveform (Fig. 3).

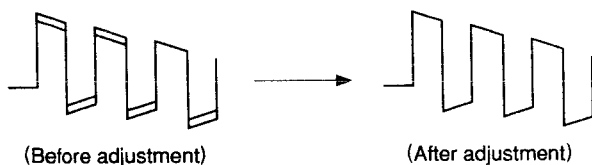


Fig. 3

5. Exchange the input signal to PAL special color bar signal.
6. Rotate RV101 until the part of ANTI PAL waveform corresponds with the level "0". (Fig. 4)

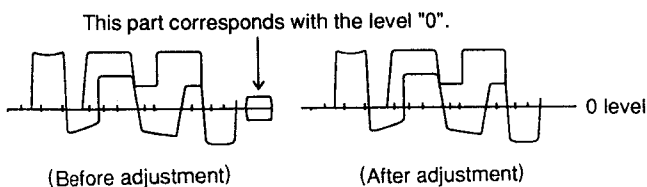


Fig. 4

* RV101 and L103 influence each other. Repeat adjustment until both conditions are satisfied.

SECAM ID Adjustment (L108)

1. Input SECAM color bar.
2. Set to SECAM forced MODE.

Note. 3 : SECAM forced MODE signify to apply +12V to IC2 pin-27 through 3.3K Ω in this case.

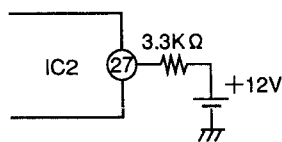


Fig. 5

3. Connect digital multimeter to TP4. (input impedance over 50M Ω)
4. Rotate L108 to the maximum indicates point.

BELL Filter Adjustment (L120)

1. Input SECAM color bar.
2. Set to SECAM forced MODE.
3. Connect oscilloscope to TP3 and view the waveform of H block.
4. Adjust L120 until the waveform become flat. (Fig. 6)

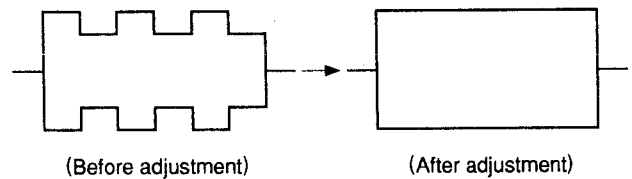


Fig. 6

* Stabilize the tracking of L120 and L108.

SECAM DISCRI Adjustment (L106, L107)

1. Input SECAM color bar.
2. Set to SECAM forced MODE and maximize the color lead.
3. Connect oscilloscope to TP8 and view the waveform of H block.
4. Adjust L106 until suitable for white and black part of TP8 waveform become at 0 – level. (Fig. 7)

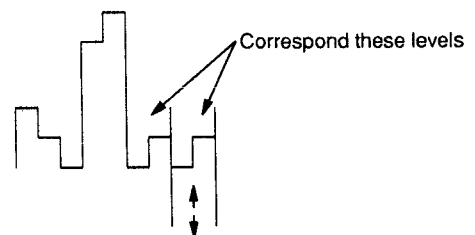


Fig. 7

5. Connect oscilloscope to TP10 and view the waveform of H block.
6. Adjust L107 until suitable for white and black part of TP10 waveform become at 0 – level. (Fig. 8)

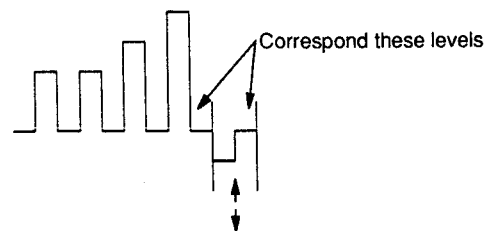


Fig. 8

7. Reset the color level.

* Maximum color level → CN206 connector.

pin-4 -8.5V

RESET pin-4 4.5V

8. Confirm that white and black part has not colored with using a monitor.

SUB PICTURE Adjustment (RV102)

1. Input 100 IRE uniform white signal . (with burst)
2. Connect oscilloscope to TP9 and view the waveform of H block.
3. Adjust RV102 so that the amplitude from pedestal to peak become 0.76–0.80Vp-p. (Fig. 9)

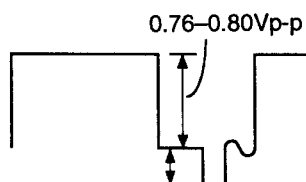


Fig. 9

4. Input 101RE uniform white signal. (with burst)
5. Transfer the voltage of CN206 pin-1 to 5V.
6. Confirm the level keeps within $0.068V_{p-p} \pm 0.01V_{p-p}$.
7. Transfer the voltage of CN206 pin-1 to 0V.
8. Confirm the level becomes $0V \pm 0.1V_{p-p}$.
9. Transfer the voltage of CN206 pin-1 to 5V.

HUE, SUB COLOR, SUB HUE Adjustment (RV107, RV106, RV105)

1. Input PAL color bar signal.
2. Connect oscilloscope to TP10 and view the waveform of H block.
3. Adjust RV107 (HUE ADJ) and RV106 (SUB COL) until the waveform become flat. (Fig. 10)

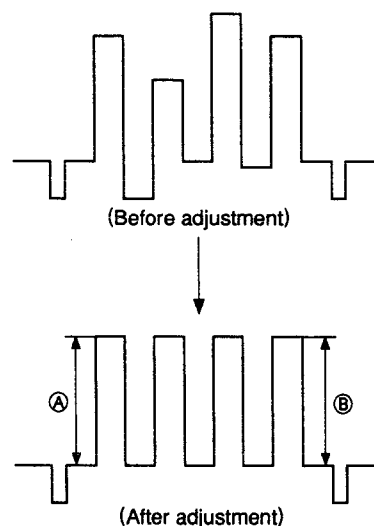


Fig. 10

4. Confirm the level of ② is $\pm 0.05V$ confirm with the level of ① in this figure.
5. Exchange the input signal to NTSC color bar.
6. Adjust RV105 (SUB HUE) until the waveform become flat.
7. Confirm the level of ② is $\pm 0.05V$ confirm with the level of ① in this figure.

SHARPNESS CHARACTERISTIC ADJUSTMENT (RV108)

1. Input VIDEO SWEEP signal to CN111 pin ⑤ on BA board.
2. Connect oscilloscope to TP10 and view the waveform of V block.
3. Adjust RV108 to become $4.0dB \pm 1.0dB$ around 3.1MHz. (Fig. 11)

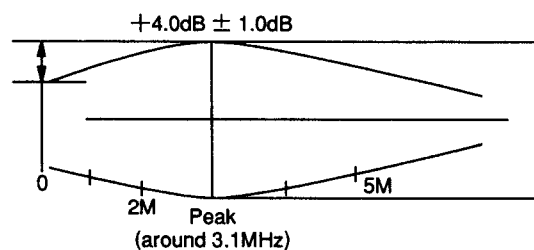
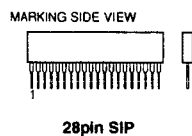


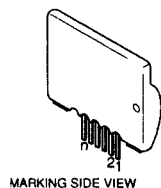
Fig. 11

SECTION 6 SEMICONDUCTORS

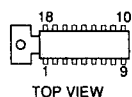
BX-1121



BX-1122



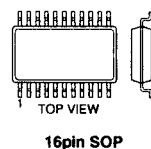
CXA1044BP



CXA1216P
TDA4555/V1



CXA1315M
HD14053BFP
MC14040BF
MC14046BF
MC14053BF
MC74HC4053F



CXA1387S
SBX1765-01



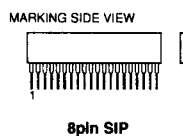
CXP85220A-012S



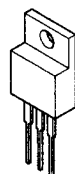
CX7916
LM393P
LM6361M
MM1170BFB
RC4558P
TL082ACP
μPC393C
μPC4558C
μPC4570C
X24C02P



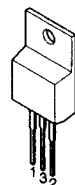
CX7948A
M5218AL



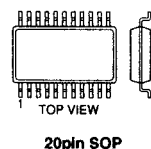
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NJM7808FA
NJM78M09FA
NJM7809FA
NJM7812FA
TA7812S



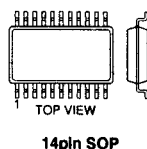
NJM7908FA
NJM7912FA
RC7908FA
μPC79M12HF



MB88346BPF



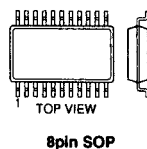
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MC14024BF
MC14066BF
MC14069UBF
MC14071BF
MC14081BF
MC14082BF



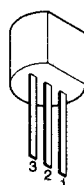
MC14052BCP
MC14053BCP



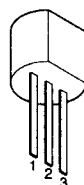
NJM2228M
μPC4558G2



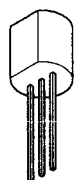
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NJM78L06A



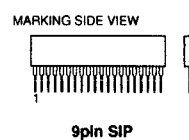
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NJM79L12A



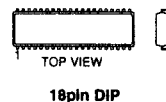
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μPC78L12J



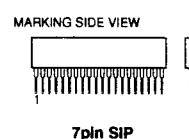
TA7348P



TDA4565



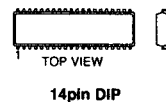
μPC1037HA



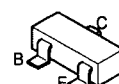
μPC1377C



μPC1394C



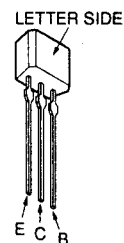
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DTC144EK
2SA1162-G
2SA812-M5M6
2SC1623-L5L6
2SC2712-YG



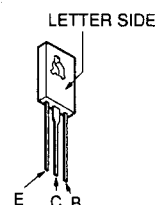
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DTC144WS
2SC1740S-QR



2SA1175-HFE
2SC2785-HFE



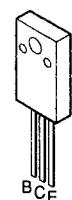
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2SA1381-D
2SA1381-E
2SC2688-LK
2SC3503-DE



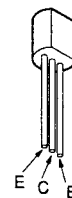
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2SC3668-O



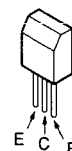
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2SA933S-QR
2SC2383-O

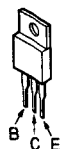


2SB734-34

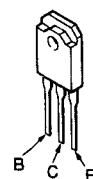


TRANSISTOR, DIODE

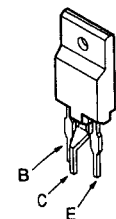
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2SC3675
2SC4161CB
2SD1399-CA
2SD2202
2SD982



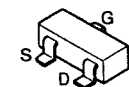
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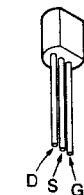
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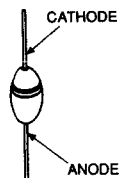
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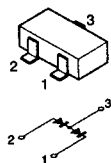
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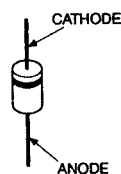
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ERC26-15S
V06C
V09G
V11N
V19E



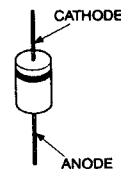
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1SS226



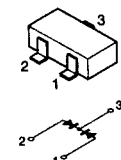
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RS3FC
RU-1C



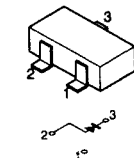
ERD28-08S



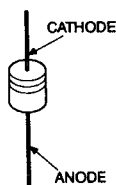
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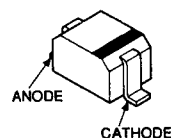
RD3.3M-B2
RD4.3M-B1
RD5.1M-B1
RD5.1M-B2
RD5.1M-B3
RD5.6M-B1
RD6.2M-B1
RD6.8M-B2
RD7.5M-B2
RD12M-B1
RD12M-B2



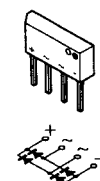
RD5.1ES-B2
RD6.8ES-B3
RD8.2ES-B3
RD13ES-B2
RD15ES-B2
WG713A
1SS119-25



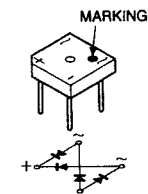
RD5.1SB1-T2



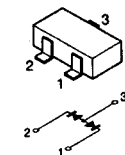
S1VB20
S1VB40



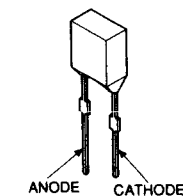
S3WB60Z



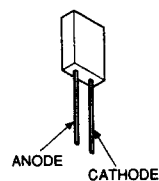
1S2835
1S2836



LN342GPH



LN242RPH



SECTION 7

EXPLODED VIEWS

NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.

- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

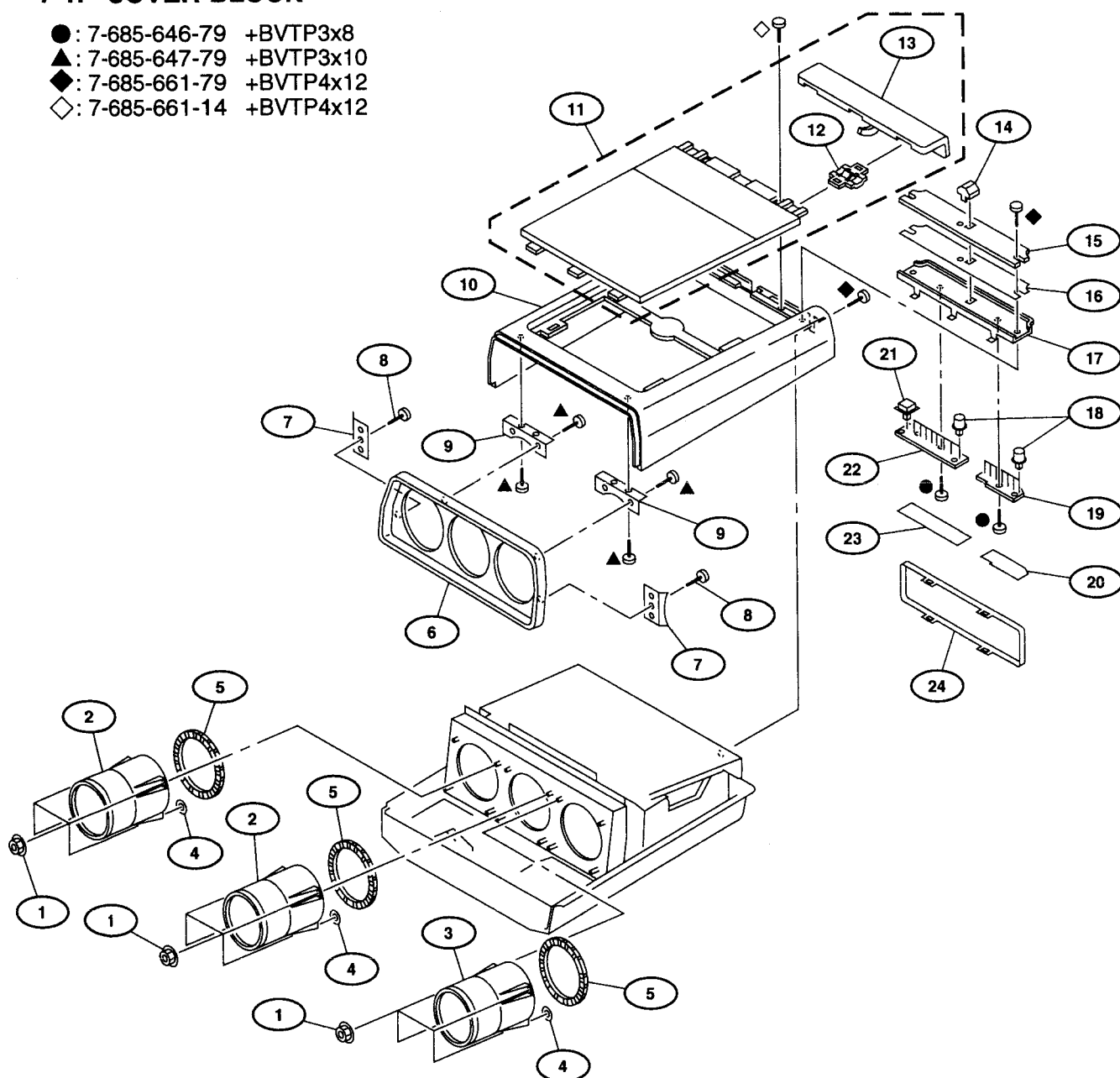
The components identified by mark Δ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

COVER BLOCK

7-1. COVER BLOCK

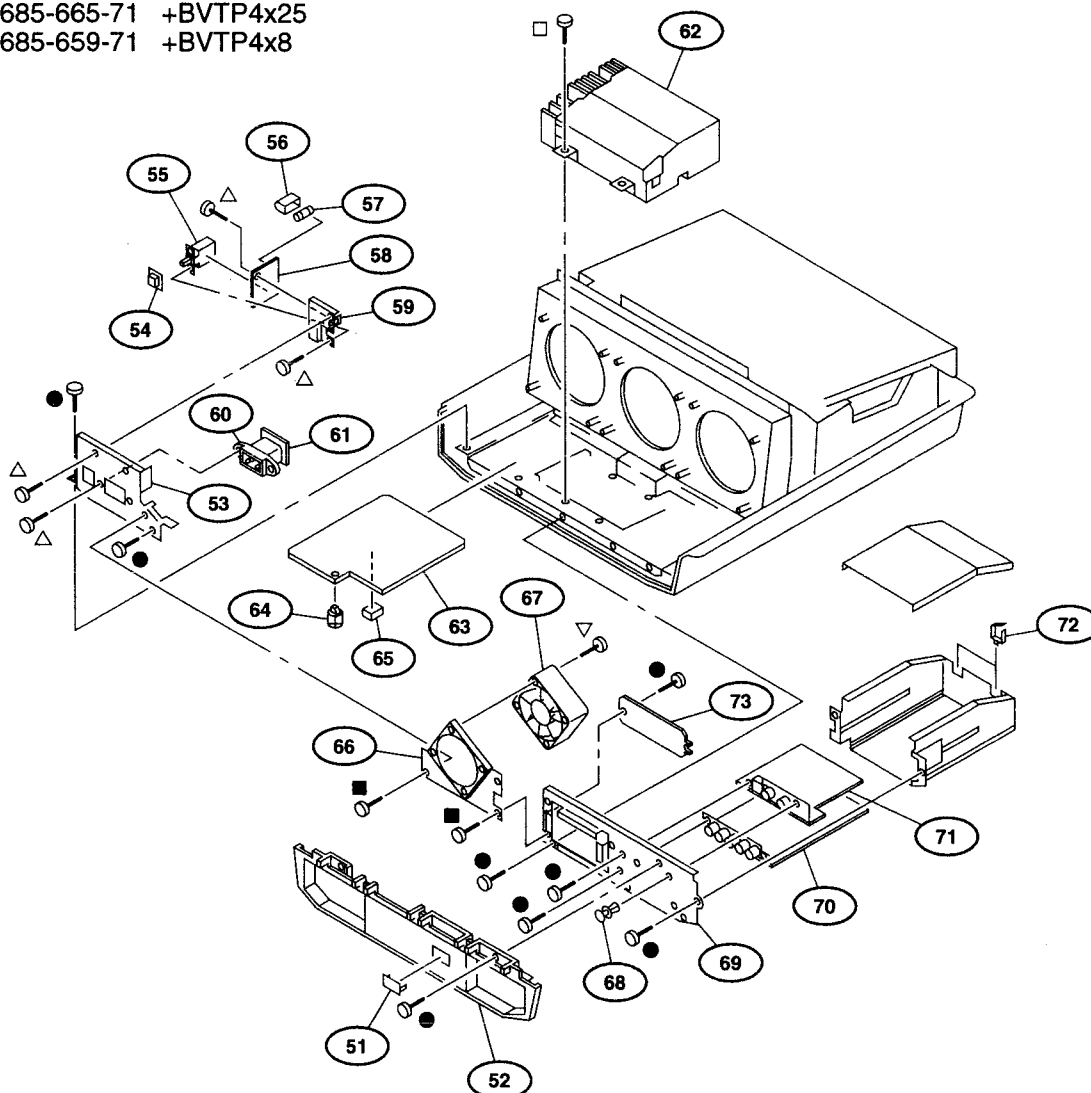
- : 7-685-646-79 +BVTP3x8
- ▲: 7-685-647-79 +BVTP3x10
- ◆: 7-685-661-79 +BVTP4x12
- ◇: 7-685-661-14 +BVTP4x12



Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
1	4-304-749-00	NUT (M4), FLANGE		12	3-659-618-00	HINGE, SPRING	
2	4-047-478-01	LENS, DELTATA AC-4 (V20MV20U)		13	X-4036-125-1	DOOR ASSY (V20M)	
2	4-383-089-43	LENS, DELTATA HD6 (V22M)		13	X-4036-130-1	DOOR ASSY (V20U/V22M)	
3	4-047-478-11	LENS, DELTATA AC-4 (V20MV20U)		14	4-030-100-01	CAP, LAMP	
3	4-383-089-33	LENS, DELTATA HD6 (V22M)		15	4-045-321-11	PLATE (M), ORNAMENTAL CONTROL	
4	3-639-647-00	WASHER		16	4-045-322-11	SHEET (M), CONTROL	
5	*4-378-642-01	WASHER, LENS		17	4-040-261-02	PANEL, CONTROL	
6	4-383-064-21	PANEL, LENS (V20M)		18	4-040-245-02	BUTTON	
6	4-383-064-31	PANEL, LENS (V20U/V22M)		19	*A-1372-017-A	HA BOARD, COMPLETE	
7	*4-383-038-01	BRACKET (B), LENS PANEL		20	4-040-250-01	SHEET, HA	
8	4-029-432-01	SCREW (3X12), (+) BVWHTP		21	4-040-246-02	BUTTON, POWER SWITCH	
9	*4-383-021-01	BRACKET, LENS PANEL		22	*A-1372-602-A	HB BOARD, COMPLETE	
10	4-378-655-61	CABINET (V20M)		23	4-040-251-01	SHEET, HB	
10	4-378-655-71	CABINET (V20U/V22M)		24	4-033-269-41	PANEL, REAR (V20M)	
11	X-4036-122-1	PLATE ASSY, TOP (V20M)	12,13	24	4-033-269-51	PANEL, REAR (V20U/V22M)	
11	X-4036-129-1	PLATE ASSY, TOP (V20U/V22M)	12,13				

7-2. FRONT PANEL BLOCK

- : 7-685-646-79 +BVTP3x8
 ■: 7-685-659-79 +BVTP4x8
 △: 7-682-948-09 +PSW3x8
 ▽: 7-685-665-71 +BVTP4x25
 □: 7-685-659-71 +BVTP4x8

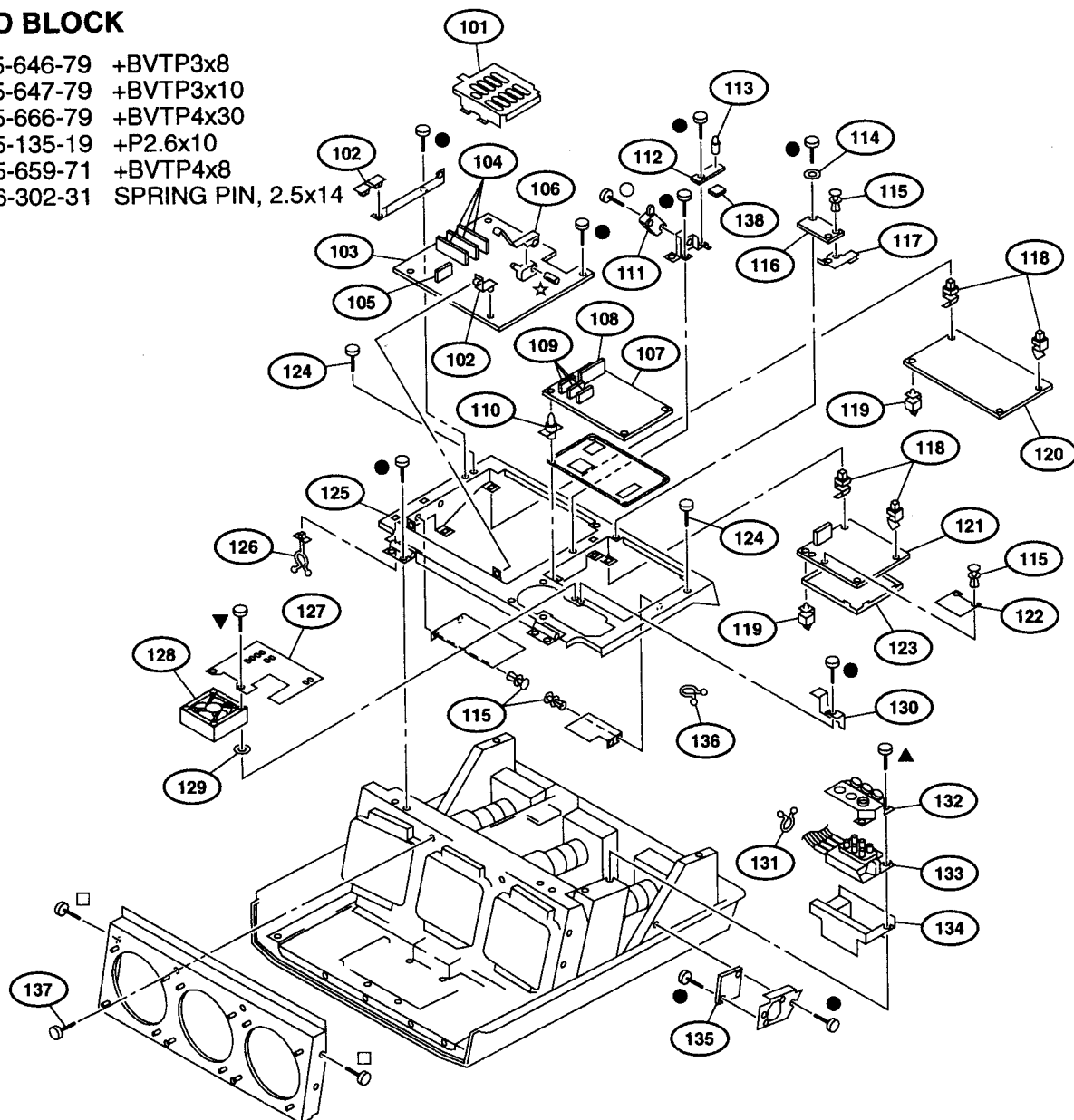


Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
51	4-056-411-01	PLATE (F), INDICATE		62	△1-413-289-12	REGULATOR, SWITCHING (TK-15)	
52	4-383-063-11	PANEL, CONNECTOR (V20M)		63	* A-1241-348-A	FA BOARD, COMPLETE (V20M/V22M)	
52	4-383-063-21	PANEL, CONNECTOR (V20U/V22M)		63	* A-1241-349-A	FA BOARD, COMPLETE (V20U)	
53	4-383-049-21	PANEL (F), CONNECTOR (V20M)		64	* 3-687-542-41	SPACER, PC BOARD SPACE	
53	4-383-049-31	PANEL (F), CONNECTOR (V20U/V22M)		65	4-040-210-01	CUSHION, FA	
54	4-362-811-00	BUTTON, MAIN POWER		66	4-383-041-02	HOLDER, FAN	
55	△1-692-349-11	SWITCH, PUSH (AC POWER)		67	1-698-046-11	FAN, DC	
56	* 4-047-336-01	COVER, FUSE		68	4-374-303-01	RIVET, NYLON	
57	△1-532-299-11	FUSE, TIME-LAG (5A/250V)		69	4-044-861-21	CHASSIS (R), FRONT (V20M)	
57	△1-532-747-11	FUSE, GLASS TUBE (5A/125V) (V20M/V22M)		69	4-044-861-31	CHASSIS (R), FRONT (V20U/V22M)	
58	* 1-672-044-11	FB BOARD		70	* A-1270-344-A	QA BOARD, COMPLETE	
59	* 4-067-413-01	BRACKET, AC SW		71	* A-1270-409-A	QB BOARD, COMPLETE	
60	△1-580-375-11	INLET 3P		72	* 4-316-015-00	HOLDER, WIRE	
61	* 1-672-041-11	FC BOARD		73	* 1-672-042-11	N BOARD	

ED BLOCK

7-3. ED BLOCK

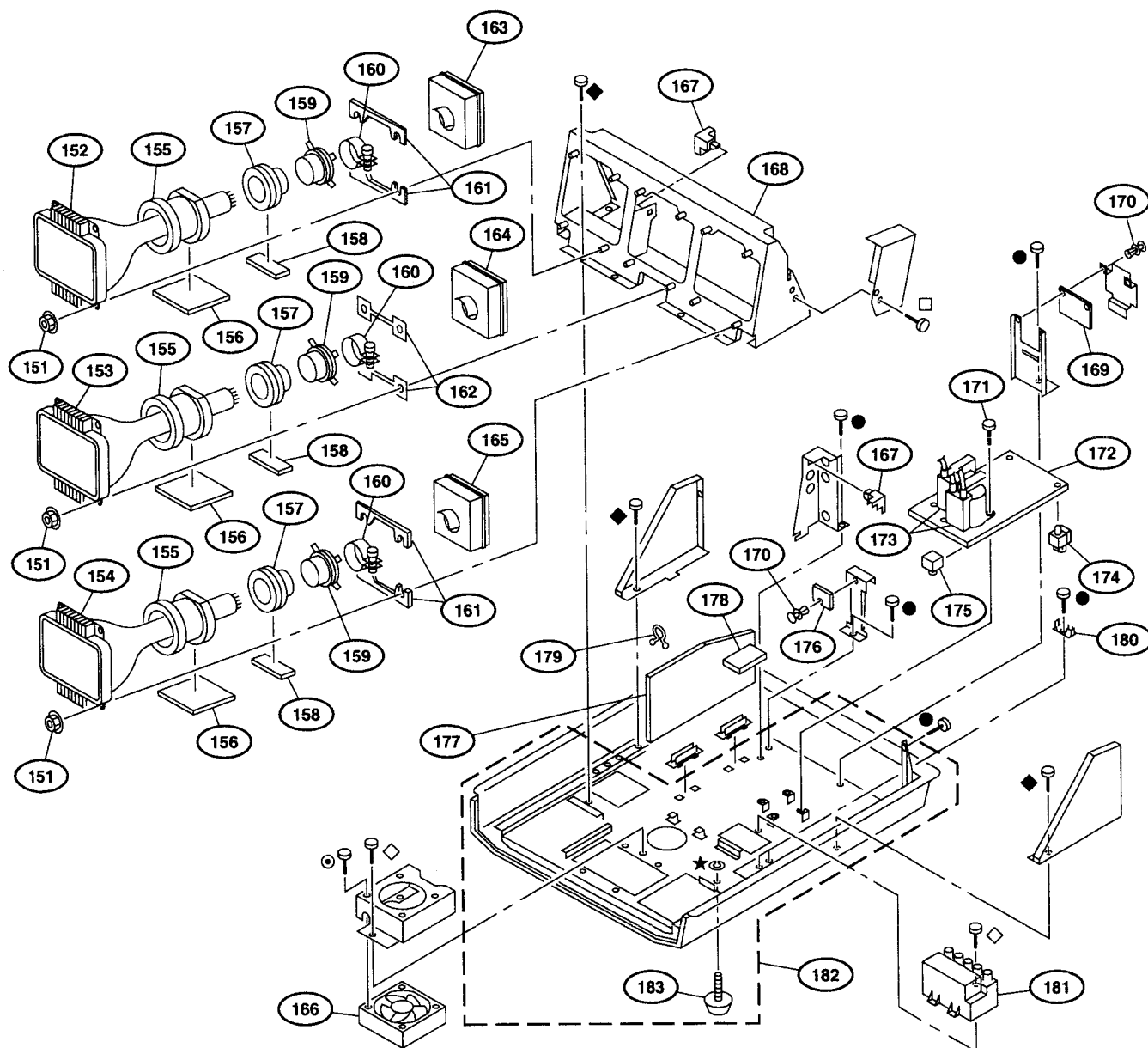
- : 7-685-646-79 +BVTP3x8
- ▲ : 7-685-647-79 +BVTP3x10
- ▼ : 7-685-666-79 +BVTP4x30
- : 7-685-135-19 +P2.6x10
- : 7-685-659-71 +BVTP4x8
- ☆ : 7-626-302-31 SPRING PIN, 2.5x14



Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
101	*4-383-047-01	COVER, REGISTRATION ADJUSTMENT		120	*A-1131-386-A	BB BOARD, COMPLETE	
102	*4-313-732-00	CLIP, HINGE, CIRCUIT BOARD		121	*A-1135-813-A	BA BOARD, COMPLETE	
103	*A-1341-786-A	D BOARD, COMPLETE	104,105	122	*4-040-249-01	DUCT, BA	
104	*1-621-059-11	DB BOARD		123	*4-040-256-01	CASE(LOWER LID), SHIELD,BA PWB	
105	*A-1341-803-A	DA BOARD, COMPLETE		124	4-389-025-01	SCREW (M4) (EXT TOOTH WASHER)	
106	*4-378-608-01	ACTUATOR		125	X-4378-626-6	BRACKET ASSY, PC BOARD	
107	*A-1340-922-C	E BOARD, COMPLETE	108,109	126	3-703-319-01	PURSE LOCK (DIA.15)	
108	*1-621-055-11	EB BOARD		127	*4-040-255-01	COVER, E PROTECTION	
109	*1-621-060-11	EC BOARD		128	1-698-046-11	FAN, DC	
110	*3-703-353-02	SUPPORT, PC BOARD		129	3-723-855-01	SPACER	
111	△1-552-437-11	SWITCH, LEVER		130	*4-387-737-02	HOLDER, E PC BOARD	
112	*1-621-051-21	X BOARD		131	3-701-474-02	LOCK, PURSE	
113	1-518-590-11	LAMP, PILOT (WITH HOLDER)		132	*4-032-125-01	COVER (B), FOCUS PACK	
114	4-309-378-00	WASHER		133	△1-237-582-13	RESISTOR ASSY, HIGH-VOLTAGE	
115	4-374-303-01	RIVET, NYLON		134	*4-383-037-01	COVER, FOCUS PACK	
116	*A-1372-037-A	HC BOARD, COMPLETE		135	*A-1340-979-A	ED BOARD, COMPLETE	
117	*4-040-254-01	BRACKET, HC		136	4-847-334-02	PURSE LOCK (DIA.15)	
118	*4-033-278-01	HOLDER, PWB		137	4-383-072-01	SCREW (4X45) (G), TAPPING,+ BV	
119	*4-353-620-02	HINGE, PC BOARD		138	4-889-836-01	CUSHION	

7-4. BASE BLOCK

- : 7-685-646-79 +BVTP3x8
- ◆: 7-685-661-79 +BVTP4x12
- ★: 7-624-106-04 STOP RING 3.0, TYPE-E
- ⊙: 7-685-167-19 SCREW (WASHER HEAD +P4x35)
- ◇: 7-685-661-14 +BVTP4x12
- : 7-685-659-71 +BVTP4x8



Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
151	4-304-749-00	NUT (M4), FLANGE		168	*4-383-066-04	BRACKET, PICTURE TUBE	
152	△8-736-246-05	PICTURE TUBE 07MS(R)		169	*A-1190-234-A	PD BOARD, COMPLETE	
153	△8-736-244-05	PICTURE TUBE 07MS(G)		170	4-374-303-01	RIVET, NYLON	
154	△8-736-245-05	PICTURE TUBE 07MS(B)		171	4-382-854-11	SCREW (M3X10), P, SW (+)	
155	△1-451-243-13	DEFLECTION YOKE (Y636PA)		172	*A-1190-145-A	PC BOARD, COMPLETE	
156	*A-1341-784-A	DY1 BOARD, COMPLETE		173	△1-439-408-31	TRANSFORMER ASSY, FLYBACK	
157	△1-452-302-11	PICTURE TUBE NECK ASSEMBLY				(NX-2023)	
158	*A-1341-785-A	DY2 BOARD, COMPLETE		174	*3-680-721-00	HOLDER, CHASSIS	
159	△1-452-443-13	NECK ASSY, PICTURE TUBE (NA367)		175	*3-701-903-00	HOLDER, PC BOARD	
160	X-4378-637-1	BAND ASSY		176	*A-1373-475-A	Y BOARD, COMPLETE	
161	4-378-603-01	SPACER (100), PICTURE TUBE		177	*A-1190-233-A	PA BOARD, COMPLETE	178
162	*4-383-025-01	SPACER (G), PICTURE TUBE		178	*1-621-054-11	PB BOARD	
163	*A-1330-773-B	CR BOARD, COMPLETE		179	4-847-334-02	PURSE LOCK (DIA.15)	
164	*A-1330-774-B	CG BOARD, COMPLETE		180	*4-309-624-00	TERMINAL, EARTH	
165	*A-1330-775-B	CB BOARD, COMPLETE		181	△1-453-108-12	DC BLOCK, HIGH-VOLTAGE	
166	1-541-449-11	FAN, DC (WITH SENSOR)		182	X-4036-121-1	BASE ASSY (V20M)	183
167	*4-033-277-01	HOLDER, PWB		182	X-4036-128-1	BASE ASSY (V20U/V22M)	183
				183	4-378-622-01	ADJUSTOR	

SECTION 8

ELECTRICAL PARTS LIST

NOTE:

The components identified by mark Δ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- The components identified by $\boxtimes$ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS

- All resistors are in ohms
- F : nonflammable

When indicating parts by reference number, please include the board name.

• CAPACITORS

PF : $\mu\mu\text{F}$

- There are some cases the reference number on one board overlaps on the other board. Therefore, when ordering parts by the reference number, please include the board name.

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
* A-1131-386-A BB BOARD, COMPLETE *****				C224	1-163-035-00	CERAMIC CHIP 0.047MF	50V
				C225	1-163-035-00	CERAMIC CHIP 0.047MF	50V
				C226	1-163-035-00	CERAMIC CHIP 0.047MF	50V
* 1-251-307-11 SOCKET, IC				C227	1-163-035-00	CERAMIC CHIP 0.047MF	50V
<CAPACITOR>				C228	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C101	1-124-903-11	ELECT 1MF	20% 50V	C229	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C102	1-104-665-11	ELECT 100MF	20% 16V	C230	1-124-907-11	ELECT 10MF	20% 50V
C103	1-163-035-00	CERAMIC CHIP 0.047MF	50V	C231	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C104	1-126-233-11	ELECT 22MF	20% 25V	C232	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C105	1-126-233-11	ELECT 22MF	20% 25V	C233	1-163-005-11	CERAMIC CHIP 470PF	10% 50V
C106	1-126-233-11	ELECT 22MF	20% 25V	C234	1-163-006-11	CERAMIC CHIP 560PF	10% 50V
C107	1-124-903-11	ELECT 1MF	20% 50V	C235	1-163-005-11	CERAMIC CHIP 470PF	10% 50V
C108	1-124-907-11	ELECT 10MF	20% 50V	C301	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C109	1-163-035-00	CERAMIC CHIP 0.047MF	50V	C302	1-104-665-11	ELECT 100MF	20% 16V
C111	1-126-233-11	ELECT 22MF	20% 25V	C303	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C112	1-126-233-11	ELECT 22MF	20% 25V	C304	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C113	1-126-233-11	ELECT 22MF	20% 25V	C305	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C114	1-163-035-00	CERAMIC CHIP 0.047MF	50V	C306	1-124-902-00	ELECT 0.47MF	20% 50V
C115	1-104-665-11	ELECT 100MF	20% 16V	C307	1-163-003-11	CERAMIC CHIP 330PF	10% 50V
C116	1-104-665-11	ELECT 100MF	20% 16V	C308	1-163-003-11	CERAMIC CHIP 330PF	10% 50V
C117	1-104-665-11	ELECT 100MF	20% 16V	C309	1-163-003-11	CERAMIC CHIP 330PF	10% 50V
C118	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	C310	1-124-907-11	ELECT 10MF	20% 50V
C151	1-163-249-11	CERAMIC CHIP 82PF	5% 50V	C311	1-124-907-11	ELECT 10MF	20% 50V
C152	1-163-249-11	CERAMIC CHIP 82PF	5% 50V	C312	1-104-666-11	ELECT 220MF	20% 16V
C153	1-163-249-11	CERAMIC CHIP 82PF	5% 50V	C313	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C154	1-104-665-11	ELECT 100MF	20% 16V	C314	1-124-902-00	ELECT 0.47MF	20% 50V
C155	1-163-227-11	CERAMIC CHIP 10PF	0.5PF 50V	C315	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C156	1-104-665-11	ELECT 100MF	20% 16V	C316	1-124-902-00	ELECT 0.47MF	20% 50V
C157	1-163-227-11	CERAMIC CHIP 10PF	0.5PF 50V	C317	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C158	1-104-665-11	ELECT 100MF	20% 16V	C318	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C159	1-163-227-11	CERAMIC CHIP 10PF	0.5PF 50V	C319	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C161	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	C320	1-104-663-11	ELECT 33MF	20% 16V
C162	1-104-665-11	ELECT 100MF	20% 16V	C321	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C201	1-163-005-11	CERAMIC CHIP 470PF	10% 50V	C322	1-124-903-11	ELECT 1MF	20% 50V
C202	1-163-251-11	CERAMIC CHIP 100PF	5% 50V	C323	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C203	1-163-251-11	CERAMIC CHIP 100PF	5% 50V	C324	1-107-823-11	CERAMIC CHIP 0.47MF	10% 16V
C204	1-124-907-11	ELECT 10MF	20% 50V	C325	1-107-823-11	CERAMIC CHIP 0.47MF	10% 16V
C205	1-163-113-00	CERAMIC CHIP 68PF	5% 50V	C326	1-107-823-11	CERAMIC CHIP 0.47MF	10% 16V
C206	1-163-251-11	CERAMIC CHIP 100PF	5% 50V	C327	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C207	1-104-664-11	ELECT 47MF	20% 16V	C328	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C208	1-104-665-11	ELECT 100MF	20% 16V	C401	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C209	1-163-035-00	CERAMIC CHIP 0.047MF	50V	C402	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C210	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	C403	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C211	1-124-907-11	ELECT 10MF	20% 50V	C404	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C212	1-163-243-11	CERAMIC CHIP 47PF	5% 50V	C405	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C213	1-163-035-00	CERAMIC CHIP 0.047MF	50V	C406	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C214	1-163-035-00	CERAMIC CHIP 0.047MF	50V	C407	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C215	1-124-902-00	ELECT 0.47MF	20% 50V	C408	1-164-489-11	CERAMIC CHIP 0.22MF	10% 16V
C216	1-163-121-00	CERAMIC CHIP 150PF	5% 50V	C409	1-164-489-11	CERAMIC CHIP 0.22MF	10% 16V
C217	1-163-121-00	CERAMIC CHIP 150PF	5% 50V	C410	1-164-489-11	CERAMIC CHIP 0.22MF	10% 16V
C218	1-163-235-11	CERAMIC CHIP 22PF	5% 50V	C411	1-164-489-11	CERAMIC CHIP 0.22MF	10% 16V
C219	1-163-035-00	CERAMIC CHIP 0.047MF	50V	C412	1-164-489-11	CERAMIC CHIP 0.22MF	10% 16V
C220	1-124-907-11	ELECT 10MF	20% 50V	C413	1-104-663-11	ELECT 33MF	20% 16V
C221	1-163-121-00	CERAMIC CHIP 150PF	5% 50V	C414	1-126-916-11	ELECT 1000MF	20% 6.3V
C222	1-124-903-11	ELECT 1MF	20% 50V	C415	1-163-038-91	CERAMIC CHIP 0.1MF	25V
C223	1-124-903-11	ELECT 1MF	20% 50V	C416	1-163-245-11	CERAMIC CHIP 56PF	5% 50V
				C417	1-163-245-11	CERAMIC CHIP 56PF	5% 50V
				C418	1-163-229-11	CERAMIC CHIP 12PF	5% 50V

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
C419	1-163-229-11	CERAMIC CHIP 12PF	5% 50V	D303	8-719-104-34	DIODE 1S2836	
C420	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	D304	8-719-104-34	DIODE 1S2836	
C422	1-163-038-91	CERAMIC CHIP 0.1MF	25V	D305	8-719-104-34	DIODE 1S2836	
C423	1-164-489-11	CERAMIC CHIP 0.22MF	10% 16V	D306	8-719-104-34	DIODE 1S2836	
C424	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	D307	8-719-104-34	DIODE 1S2836	
C425	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	D308	8-719-104-34	DIODE 1S2836	
C426	1-104-665-11	ELECT 100MF	20% 16V	D309	8-719-105-82	DIODE RD5.1M-B2	
C427	1-163-038-91	CERAMIC CHIP 0.1MF	25V	D310	8-719-105-82	DIODE RD5.1M-B2	
C428	1-104-665-11	ELECT 100MF	20% 16V	D311	8-719-104-34	DIODE 1S2836	
C429	1-163-038-91	CERAMIC CHIP 0.1MF	25V	D312	8-719-104-34	DIODE 1S2836	
C430	1-163-025-11	CERAMIC CHIP 0.001MF	50V	D313	8-719-104-34	DIODE 1S2836	
C431	1-164-489-11	CERAMIC CHIP 0.22MF	10% 16V	D314	8-719-104-34	DIODE 1S2836	
C432	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	D401	8-719-105-90	DIODE RD5.6M-B1	
C433	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	D402	8-719-105-90	DIODE RD5.6M-B1	
C434	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	D403	8-719-105-90	DIODE RD5.6M-B1	
C435	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	D404	8-719-105-90	DIODE RD5.6M-B1	
<CONNECTOR>				D405	8-719-104-34	DIODE 1S2836	
CN301*1-566-059-11	PIN, CONNECTOR 7P			D406	8-719-104-34	DIODE 1S2836	
CN302*1-566-056-11	PIN, CONNECTOR 4P			D407	8-719-104-34	DIODE 1S2836	
CN303*1-566-061-11	PIN, CONNECTOR 9P			D408	8-719-104-34	DIODE 1S2836	
CN304*1-566-059-11	PIN, CONNECTOR 7P			D409	8-719-105-90	DIODE RD5.6M-B1	
CN305*1-566-060-11	PIN, CONNECTOR 8P			D410	8-719-105-90	DIODE RD5.6M-B1	
CN306*1-566-062-11	PIN, CONNECTOR 10P			D411	8-719-105-90	DIODE RD5.6M-B1	
CN307*1-566-057-11	PIN, CONNECTOR 5P			D412	8-719-105-90	DIODE RD5.6M-B1	
CN308*1-566-056-11	PIN, CONNECTOR 4P			D413	8-719-105-90	DIODE RD5.6M-B1	
CN309*1-566-060-11	PIN, CONNECTOR 8P			D414	8-719-105-90	DIODE RD5.6M-B1	
CN310*1-566-059-11	PIN, CONNECTOR 7P			D415	8-719-105-90	DIODE RD5.6M-B1	
CN311*1-566-057-11	PIN, CONNECTOR 5P			D418	8-719-105-90	DIODE RD5.6M-B1	
CN312*1-566-057-11	PIN, CONNECTOR 5P			D419	8-719-159-11	DIODE RD5.1SB1-T2	
CN313*1-566-057-11	PIN, CONNECTOR 5P			D420	8-719-159-11	DIODE RD5.1SB1-T2	
CN314*1-566-058-11	PIN, CONNECTOR 6P			D421	8-719-159-11	DIODE RD5.1SB1-T2	
<DIODE>				D422	8-719-106-70	DIODE RD12M-B1	
D101	8-719-104-34	DIODE 1S2836		D423	8-719-105-82	DIODE RD5.1M-B2	
D103	8-719-104-34	DIODE 1S2836		D424	8-719-105-90	DIODE RD5.6M-B1	
D104	8-719-104-34	DIODE 1S2836		D425	8-719-159-11	DIODE RD5.1SB1-T2	
D105	8-719-104-34	DIODE 1S2836		D426	8-719-159-11	DIODE RD5.1SB1-T2	
D106	8-719-104-34	DIODE 1S2836		D427	8-719-159-11	DIODE RD5.1SB1-T2	
D107	8-719-104-34	DIODE 1S2836		D428	8-719-159-11	DIODE RD5.1SB1-T2	
D108	8-719-900-95	DIODE V09G		D429	8-719-159-11	DIODE RD5.1SB1-T2	
D109	8-719-900-95	DIODE V09G		D430	8-719-104-34	DIODE 1S2836	
D110	8-719-900-95	DIODE V09G		<IC>			
D111	8-719-900-95	DIODE V09G		IC101	8-759-231-58	IC TA7812S	
D201	8-719-104-34	DIODE 1S2836		IC102	8-759-300-71	IC HD14053BFP	
D203	8-719-104-34	DIODE 1S2836		IC103	8-759-011-65	IC MC74HC4053F	
D204	8-719-104-34	DIODE 1S2836		IC104	8-759-008-67	IC MC14066BF	
D205	8-719-104-34	DIODE 1S2836		IC105	8-759-701-59	IC NJM78M09FA	
D206	8-719-104-34	DIODE 1S2836		IC106	8-759-708-05	IC NJM78L05A	
D207	8-719-104-34	DIODE 1S2836		IC107	8-759-701-88	IC NJM7912FA	
D208	8-719-104-34	DIODE 1S2836		IC151	8-759-984-88	IC LM6361M	
D209	8-719-104-34	DIODE 1S2836		IC152	8-759-984-88	IC LM6361M	
D210	8-719-104-34	DIODE 1S2836		IC153	8-759-984-88	IC LM6361M	
D211	8-719-104-34	DIODE 1S2836		IC201	8-759-009-10	IC MC14069UBF	
D301	8-719-104-34	DIODE 1S2836		IC202	8-759-009-02	IC MC14046BF	
D302	8-719-104-34	DIODE 1S2836		IC203	8-759-008-92	IC MC14024BF	
				IC204	8-759-009-02	IC MC14046BF	
				IC205	8-759-008-98	IC MC14040BF	

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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R116	1-216-049-91	RES,CHIP	1K 5% 1/10W	R210	1-216-085-00	RES,CHIP	33K 5% 1/10W
R117	1-216-049-91	RES,CHIP	1K 5% 1/10W	R211	1-216-069-00	RES,CHIP	6.8K 5% 1/10W
R118	1-216-073-00	RES,CHIP	10K 5% 1/10W	R212	1-216-077-00	RES,CHIP	15K 5% 1/10W
R119	1-216-073-00	RES,CHIP	10K 5% 1/10W	R213	1-216-097-91	RES,CHIP	100K 5% 1/10W
R120	1-216-081-00	RES,CHIP	22K 5% 1/10W	R214	1-216-061-00	RES,CHIP	3.3K 5% 1/10W
R121	1-216-085-00	RES,CHIP	33K 5% 1/10W	R215	1-216-075-00	RES,CHIP	12K 5% 1/10W
R122	1-216-085-00	RES,CHIP	33K 5% 1/10W	R216	1-216-083-00	RES,CHIP	27K 5% 1/10W
R123	1-216-049-91	RES,CHIP	1K 5% 1/10W	R218	1-216-049-91	RES,CHIP	1K 5% 1/10W
R124	1-216-049-91	RES,CHIP	1K 5% 1/10W	R220	1-216-073-00	RES,CHIP	10K 5% 1/10W
R125	1-216-049-91	RES,CHIP	1K 5% 1/10W	R221	1-216-089-91	RES,CHIP	47K 5% 1/10W
R126	1-216-049-91	RES,CHIP	1K 5% 1/10W	R222	1-216-089-91	RES,CHIP	47K 5% 1/10W
R127	1-216-033-00	RES,CHIP	220 5% 1/10W	R223	1-216-103-00	RES,CHIP	180K 5% 1/10W
R128	1-216-049-91	RES,CHIP	1K 5% 1/10W	R224	1-216-069-00	RES,CHIP	6.8K 5% 1/10W
R129	1-216-671-11	METAL CHIP	6.8K 0.50% 1/10W	R225	1-216-061-00	RES,CHIP	3.3K 5% 1/10W
R130	1-216-651-11	METAL CHIP	1K 0.50% 1/10W	R226	1-216-059-00	RES,CHIP	2.7K 5% 1/10W
R131	1-216-651-11	METAL CHIP	1K 0.50% 1/10W	R227	1-216-065-91	RES,CHIP	4.7K 5% 1/10W
R132	1-216-671-11	METAL CHIP	6.8K 0.50% 1/10W	R228	1-216-061-00	RES,CHIP	3.3K 5% 1/10W
R133	1-216-059-00	RES,CHIP	2.7K 5% 1/10W	R229	1-216-073-00	RES,CHIP	10K 5% 1/10W
R134	1-216-059-00	RES,CHIP	2.7K 5% 1/10W	R230	1-216-099-00	RES,CHIP	120K 5% 1/10W
R135	1-216-059-00	RES,CHIP	2.7K 5% 1/10W	R231	1-216-065-91	RES,CHIP	4.7K 5% 1/10W
R136	1-216-073-00	RES,CHIP	10K 5% 1/10W	R232	1-216-049-91	RES,CHIP	1K 5% 1/10W
R137	1-216-671-11	METAL CHIP	6.8K 0.50% 1/10W	R233	1-216-049-91	RES,CHIP	1K 5% 1/10W
R138	1-216-651-11	METAL CHIP	1K 0.50% 1/10W	R234	1-216-057-00	RES,CHIP	2.2K 5% 1/10W
R139	1-216-025-91	RES,CHIP	100 5% 1/10W	R235	1-216-075-00	RES,CHIP	12K 5% 1/10W
R140	1-216-025-91	RES,CHIP	100 5% 1/10W	R236	1-216-097-91	RES,CHIP	100K 5% 1/10W
R141	1-216-025-91	RES,CHIP	100 5% 1/10W	R237	1-216-089-91	RES,CHIP	47K 5% 1/10W
R142	1-216-025-91	RES,CHIP	100 5% 1/10W	R238	1-216-089-91	RES,CHIP	47K 5% 1/10W
R143	1-216-025-91	RES,CHIP	100 5% 1/10W	R239	1-216-097-91	RES,CHIP	100K 5% 1/10W
R144	1-216-025-91	RES,CHIP	100 5% 1/10W	R240	1-216-077-00	RES,CHIP	15K 5% 1/10W
R145	1-216-025-91	RES,CHIP	100 5% 1/10W	R241	1-216-105-91	RES,CHIP	220K 5% 1/10W
R146	1-216-025-91	RES,CHIP	100 5% 1/10W	R242	1-216-097-91	RES,CHIP	100K 5% 1/10W
R147	1-216-025-91	RES,CHIP	100 5% 1/10W	R243	1-216-049-91	RES,CHIP	1K 5% 1/10W
R148	1-216-057-00	RES,CHIP	2.2K 5% 1/10W	R244	1-216-083-00	RES,CHIP	27K 5% 1/10W
R149	1-216-069-00	RES,CHIP	6.8K 5% 1/10W	R245	1-216-109-00	RES,CHIP	330K 5% 1/10W
R153	1-216-025-91	RES,CHIP	100 5% 1/10W	R246	1-216-091-00	RES,CHIP	56K 5% 1/10W
R154	1-216-025-91	RES,CHIP	100 5% 1/10W	R247	1-216-073-00	RES,CHIP	10K 5% 1/10W
R155	1-216-025-91	RES,CHIP	100 5% 1/10W	R248	1-216-083-00	RES,CHIP	27K 5% 1/10W
R156	1-216-089-91	RES,CHIP	47K 5% 1/10W	R249	1-216-097-91	RES,CHIP	100K 5% 1/10W
R157	1-216-677-11	METAL CHIP	12K 0.50% 1/10W	R250	1-216-097-91	RES,CHIP	100K 5% 1/10W
R158	1-216-691-11	METAL CHIP	47K 0.50% 1/10W	R251	1-216-077-00	RES,CHIP	15K 5% 1/10W
R159	1-216-657-11	METAL CHIP	1.8K 0.50% 1/10W	R252	1-216-025-91	RES,CHIP	100 5% 1/10W
R160	1-216-089-91	RES,CHIP	47K 5% 1/10W	R253	1-216-049-91	RES,CHIP	1K 5% 1/10W
R161	1-216-677-11	METAL CHIP	12K 0.50% 1/10W	R254	1-216-057-00	RES,CHIP	2.2K 5% 1/10W
R162	1-216-691-11	METAL CHIP	47K 0.50% 1/10W	R255	1-216-089-91	RES,CHIP	47K 5% 1/10W
R163	1-216-657-11	METAL CHIP	1.8K 0.50% 1/10W	R256	1-216-081-00	RES,CHIP	22K 5% 1/10W
R164	1-216-089-91	RES,CHIP	47K 5% 1/10W	R257	1-216-073-00	RES,CHIP	10K 5% 1/10W
R165	1-216-677-11	METAL CHIP	12K 0.50% 1/10W	R258	1-216-061-00	RES,CHIP	3.3K 5% 1/10W
R166	1-216-691-11	METAL CHIP	47K 0.50% 1/10W	R260	1-216-041-00	RES,CHIP	470 5% 1/10W
R167	1-216-657-11	METAL CHIP	1.8K 0.50% 1/10W	R301	1-216-031-00	RES,CHIP	180 5% 1/10W
R201	1-216-049-91	RES,CHIP	1K 5% 1/10W	R302	1-216-031-00	RES,CHIP	180 5% 1/10W
R202	1-216-049-91	RES,CHIP	1K 5% 1/10W	R303	1-216-031-00	RES,CHIP	180 5% 1/10W
R203	1-216-065-91	RES,CHIP	4.7K 5% 1/10W	R304	1-216-025-91	RES,CHIP	100 5% 1/10W
R204	1-216-061-00	RES,CHIP	3.3K 5% 1/10W	R305	1-216-025-91	RES,CHIP	100 5% 1/10W
R205	1-216-061-00	RES,CHIP	3.3K 5% 1/10W	R306	1-216-025-91	RES,CHIP	100 5% 1/10W
R206	1-216-061-00	RES,CHIP	3.3K 5% 1/10W	R307	1-216-025-91	RES,CHIP	100 5% 1/10W
R208	1-216-059-00	RES,CHIP	2.7K 5% 1/10W	R308	1-216-025-91	RES,CHIP	100 5% 1/10W
R209	1-216-049-91	RES,CHIP	1K 5% 1/10W	R309	1-216-025-91	RES,CHIP	100 5% 1/10W
				R310	1-216-655-11	METAL CHIP	1.5K 0.50% 1/10W

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R311	1-216-643-11	METAL CHIP	470 0.50%1/10W	R370	1-216-699-11	METAL CHIP	100K 0.50%1/10W
R312	1-216-017-91	RES,CHIP	47 5% 1/10W	R371	1-216-061-00	RES,CHIP	3.3K 5% 1/10W
R313	1-216-027-00	RES,CHIP	120 5% 1/10W	R372	1-216-025-91	RES,CHIP	100 5% 1/10W
R314	1-216-027-00	RES,CHIP	120 5% 1/10W	R373	1-216-025-91	RES,CHIP	100 5% 1/10W
R315	1-216-013-00	RES,CHIP	33 5% 1/10W	R374	1-216-681-11	METAL CHIP	18K 0.50%1/10W
R316	1-216-045-00	RES,CHIP	680 5% 1/10W	R375	1-216-669-11	METAL CHIP	5.6K 0.50%1/10W
R317	1-216-025-91	RES,CHIP	100 5% 1/10W	R376	1-216-675-11	METAL CHIP	10K 0.50%1/10W
R318	1-216-655-11	METAL CHIP	1.5K 0.50%1/10W	R377	1-216-079-00	RES,CHIP	18K 5% 1/10W
R319	1-216-643-11	METAL CHIP	470 0.50%1/10W	R378	1-216-661-11	METAL CHIP	2.7K 0.50%1/10W
R320	1-216-017-91	RES,CHIP	47 5% 1/10W	R379	1-216-673-11	METAL CHIP	8.2K 0.50%1/10W
R321	1-216-025-91	RES,CHIP	100 5% 1/10W	R380	1-216-673-11	METAL CHIP	8.2K 0.50%1/10W
R322	1-216-027-00	RES,CHIP	120 5% 1/10W	R381	1-216-673-11	METAL CHIP	8.2K 0.50%1/10W
R323	1-216-013-00	RES,CHIP	33 5% 1/10W	R382	1-216-073-00	RES,CHIP	10K 5% 1/10W
R324	1-216-045-00	RES,CHIP	680 5% 1/10W	R383	1-216-105-91	RES,CHIP	220K 5% 1/10W
R325	1-216-655-11	METAL CHIP	1.5K 0.50%1/10W	R384	1-216-105-91	RES,CHIP	220K 5% 1/10W
R326	1-216-643-11	METAL CHIP	470 0.50%1/10W	R385	1-216-105-91	RES,CHIP	220K 5% 1/10W
R327	1-216-017-91	RES,CHIP	47 5% 1/10W	R386	1-216-111-00	RES,CHIP	390K 5% 1/10W
R328	1-216-025-91	RES,CHIP	100 5% 1/10W	R387	1-216-097-91	RES,CHIP	100K 5% 1/10W
R329	1-216-037-00	RES,CHIP	330 5% 1/10W	R388	1-216-097-91	RES,CHIP	100K 5% 1/10W
R330	1-216-027-00	RES,CHIP	120 5% 1/10W	R389	1-216-073-00	RES,CHIP	10K 5% 1/10W
R331	1-216-013-00	RES,CHIP	33 5% 1/10W	R390	1-216-097-91	RES,CHIP	100K 5% 1/10W
R332	1-216-045-00	RES,CHIP	680 5% 1/10W	R391	1-216-097-91	RES,CHIP	100K 5% 1/10W
R333	1-216-065-91	RES,CHIP	4.7K 5% 1/10W	R392	1-216-049-91	RES,CHIP	1K 5% 1/10W
R334	1-216-670-11	METAL CHIP	6.2K 0.50%1/10W	R393	1-216-091-00	RES,CHIP	56K 5% 1/10W
R335	1-216-059-00	RES,CHIP	2.7K 5% 1/10W	R394	1-216-083-00	RES,CHIP	27K 5% 1/10W
R336	1-216-059-00	RES,CHIP	2.7K 5% 1/10W	R395	1-216-083-00	RES,CHIP	27K 5% 1/10W
R337	1-216-033-00	RES,CHIP	220 5% 1/10W	R396	1-216-051-00	RES,CHIP	1.2K 5% 1/10W
R338	1-216-001-00	RES,CHIP	10 5% 1/10W	R397	1-216-051-00	RES,CHIP	1.2K 5% 1/10W
R339	1-216-638-11	METAL CHIP	300 0.50%1/10W	R398	1-216-051-00	RES,CHIP	1.2K 5% 1/10W
R340	1-216-097-91	RES,CHIP	100K 5% 1/10W	R401	1-216-049-91	RES,CHIP	1K 5% 1/10W
R341	1-216-627-11	METAL CHIP	100 0.50%1/10W	R402	1-216-071-00	RES,CHIP	8.2K 5% 1/10W
R342	1-216-025-91	RES,CHIP	100 5% 1/10W	R403	1-216-073-00	RES,CHIP	10K 5% 1/10W
R343	1-216-107-00	RES,CHIP	270K 5% 1/10W	R404	1-216-081-00	RES,CHIP	22K 5% 1/10W
R344	1-216-093-00	RES,CHIP	68K 5% 1/10W	R405	1-216-073-00	RES,CHIP	10K 5% 1/10W
R345	1-216-073-00	RES,CHIP	10K 5% 1/10W	R407	1-216-057-00	RES,CHIP	2.2K 5% 1/10W
R346	1-216-099-00	RES,CHIP	120K 5% 1/10W	R410	1-216-025-91	RES,CHIP	100 5% 1/10W
R347	1-216-057-00	RES,CHIP	2.2K 5% 1/10W	R411	1-216-025-91	RES,CHIP	100 5% 1/10W
R348	1-216-093-00	RES,CHIP	68K 5% 1/10W	R412	1-216-025-91	RES,CHIP	100 5% 1/10W
R349	1-216-057-00	RES,CHIP	2.2K 5% 1/10W	R413	1-216-069-00	RES,CHIP	6.8K 5% 1/10W
R350	1-216-689-11	RES,CHIP	39K 5% 1/10W	R414	1-216-057-00	RES,CHIP	2.2K 5% 1/10W
R351	1-216-091-00	RES,CHIP	56K 5% 1/10W	R415	1-216-057-00	RES,CHIP	2.2K 5% 1/10W
R352	1-216-057-00	RES,CHIP	2.2K 5% 1/10W	R416	1-216-057-00	RES,CHIP	2.2K 5% 1/10W
R353	1-216-073-00	RES,CHIP	10K 5% 1/10W	R417	1-216-073-00	RES,CHIP	10K 5% 1/10W
R354	1-216-089-91	RES,CHIP	47K 5% 1/10W	R418	1-216-073-00	RES,CHIP	10K 5% 1/10W
R355	1-216-093-00	RES,CHIP	68K 5% 1/10W	R421	1-216-089-91	RES,CHIP	47K 5% 1/10W
R356	1-216-093-00	RES,CHIP	68K 5% 1/10W	R423	1-216-049-91	RES,CHIP	1K 5% 1/10W
R359	1-216-677-11	METAL CHIP	12K 0.50%1/10W	R425	1-216-033-00	RES,CHIP	220 5% 1/10W
R360	1-216-677-11	METAL CHIP	12K 0.50%1/10W	R426	1-216-033-00	RES,CHIP	220 5% 1/10W
R361	1-216-663-11	METAL CHIP	3.3K 0.50%1/10W	R427	1-216-065-91	RES,CHIP	4.7K 5% 1/10W
R362	1-216-683-11	METAL CHIP	22K 0.50%1/10W	R428	1-216-065-91	RES,CHIP	4.7K 5% 1/10W
R363	1-216-683-11	METAL CHIP	22K 0.50%1/10W	R429	1-216-065-91	RES,CHIP	4.7K 5% 1/10W
R364	1-216-689-11	METAL CHIP	39K 0.50%1/10W	R430	1-216-073-00	RES,CHIP	10K 5% 1/10W
R365	1-216-669-11	METAL CHIP	5.6K 0.50%1/10W	R431	1-216-073-00	RES,CHIP	10K 5% 1/10W
R366	1-216-661-11	METAL CHIP	2.7K 0.50%1/10W	R432	1-216-033-00	RES,CHIP	220 5% 1/10W
R367	1-216-699-11	METAL CHIP	100K 0.50%1/10W	R433	1-216-073-00	RES,CHIP	10K 5% 1/10W
R368	1-216-691-11	METAL CHIP	47K 0.50%1/10W	R434	1-216-049-91	RES,CHIP	1K 5% 1/10W
R369	1-216-699-11	METAL CHIP	100K 0.50%1/10W	R435	1-216-049-91	RES,CHIP	1K 5% 1/10W
				R436	1-216-049-91	RES,CHIP	1K 5% 1/10W

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R437	1-216-073-00	RES,CHIP	10K 5% 1/10W	R502	1-216-049-91	RES,CHIP	1K 5% 1/10W
R438	1-216-049-91	RES,CHIP	1K 5% 1/10W	R504	1-216-049-91	RES,CHIP	1K 5% 1/10W
R439	1-216-049-91	RES,CHIP	1K 5% 1/10W	R505	1-216-049-91	RES,CHIP	1K 5% 1/10W
R440	1-216-073-00	RES,CHIP	10K 5% 1/10W	R506	1-216-083-00	RES,CHIP	27K 5% 1/10W
R441	1-216-049-91	RES,CHIP	1K 5% 1/10W	R515	1-216-073-00	RES,CHIP	10K 5% 1/10W
R442	1-216-073-00	RES,CHIP	10K 5% 1/10W	R516	1-216-665-11	METAL CHIP	3.9K 0.50% 1/10W
R443	1-216-057-00	RES,CHIP	2.2K 5% 1/10W	R517	1-216-658-11	METAL CHIP	2K 0.50% 1/10W
R444	1-216-057-00	RES,CHIP	2.2K 5% 1/10W	R518	1-216-665-11	METAL CHIP	3.9K 0.50% 1/10W
R445	1-216-025-91	RES,CHIP	100 5% 1/10W	R519	1-216-658-11	METAL CHIP	2K 0.50% 1/10W
R446	1-216-065-91	RES,CHIP	4.7K 5% 1/10W	R520	1-216-665-11	METAL CHIP	3.9K 0.50% 1/10W
R447	1-216-049-91	RES,CHIP	1K 5% 1/10W	R521	1-216-658-11	METAL CHIP	2K 0.50% 1/10W
R452	1-216-025-91	RES,CHIP	100 5% 1/10W	R522	1-216-033-00	RES,CHIP	220 5% 1/10W
R453	1-216-025-91	RES,CHIP	100 5% 1/10W	R524	1-216-049-91	RES,CHIP	1K 5% 1/10W
R454	1-216-025-91	RES,CHIP	100 5% 1/10W	R525	1-216-049-91	RES,CHIP	1K 5% 1/10W
R455	1-216-025-91	RES,CHIP	100 5% 1/10W	R526	1-216-049-91	RES,CHIP	1K 5% 1/10W
R456	1-216-033-00	RES,CHIP	220 5% 1/10W	R527	1-216-065-91	RES,CHIP	4.7K 5% 1/10W
R458	1-216-065-91	RES,CHIP	4.7K 5% 1/10W	R528	1-216-065-91	RES,CHIP	4.7K 5% 1/10W
R459	1-216-059-00	RES,CHIP	2.7K 5% 1/10W	R529	1-216-065-91	RES,CHIP	4.7K 5% 1/10W
R460	1-216-059-00	RES,CHIP	2.7K 5% 1/10W	R530	1-216-065-91	RES,CHIP	4.7K 5% 1/10W
R461	1-216-059-00	RES,CHIP	2.7K 5% 1/10W	R531	1-216-033-00	RES,CHIP	220 5% 1/10W
R462	1-216-059-00	RES,CHIP	2.7K 5% 1/10W	R532	1-216-033-00	RES,CHIP	220 5% 1/10W
R463	1-216-059-00	RES,CHIP	2.7K 5% 1/10W	R533	1-216-033-00	RES,CHIP	220 5% 1/10W
R464	1-216-025-91	RES,CHIP	100 5% 1/10W	R534	1-216-033-00	RES,CHIP	220 5% 1/10W
R465	1-216-025-91	RES,CHIP	100 5% 1/10W	R535	1-216-049-91	RES,CHIP	1K 5% 1/10W
R466	1-216-025-91	RES,CHIP	100 5% 1/10W	R537	1-216-033-00	RES,CHIP	220 5% 1/10W
R467	1-216-025-91	RES,CHIP	100 5% 1/10W	R538	1-216-033-00	RES,CHIP	220 5% 1/10W
R468	1-216-025-91	RES,CHIP	100 5% 1/10W	R539	1-216-033-00	RES,CHIP	220 5% 1/10W
R469	1-216-073-00	RES,CHIP	10K 5% 1/10W	R540	1-216-033-00	RES,CHIP	220 5% 1/10W
R470	1-216-033-00	RES,CHIP	220 5% 1/10W	R550	1-249-417-11	CARBON	1K 5% 1/4W
R471	1-216-073-00	RES,CHIP	10K 5% 1/10W				
R472	1-216-073-00	RES,CHIP	10K 5% 1/10W				
R473	1-216-065-91	RES,CHIP	4.7K 5% 1/10W				
R474	1-216-065-91	RES,CHIP	4.7K 5% 1/10W				
R475	1-216-065-91	RES,CHIP	4.7K 5% 1/10W				
R476	1-216-073-00	RES,CHIP	10K 5% 1/10W				
R477	1-216-091-00	RES,CHIP	56K 5% 1/10W				
R478	1-216-065-91	RES,CHIP	4.7K 5% 1/10W				
R479	1-216-065-91	RES,CHIP	4.7K 5% 1/10W				
R480	1-216-065-91	RES,CHIP	4.7K 5% 1/10W				
R481	1-216-065-91	RES,CHIP	4.7K 5% 1/10W				
R482	1-216-033-00	RES,CHIP	220 5% 1/10W				
R483	1-216-033-00	RES,CHIP	220 5% 1/10W				
R484	1-216-033-00	RES,CHIP	220 5% 1/10W				
R485	1-216-033-00	RES,CHIP	220 5% 1/10W				
R486	1-216-057-00	RES,CHIP	2.2K 5% 1/10W				
R487	1-216-049-91	RES,CHIP	1K 5% 1/10W				
R488	1-216-049-91	RES,CHIP	1K 5% 1/10W				
R489	1-216-049-91	RES,CHIP	1K 5% 1/10W				
R490	1-216-033-00	RES,CHIP	220 5% 1/10W				
R491	1-216-033-00	RES,CHIP	220 5% 1/10W				
R495	1-216-049-91	RES,CHIP	1K 5% 1/10W				
R496	1-216-073-00	RES,CHIP	10K 5% 1/10W				
R497	1-216-033-00	RES,CHIP	220 5% 1/10W				
R498	1-216-033-00	RES,CHIP	220 5% 1/10W				
R499	1-216-065-91	RES,CHIP	4.7K 5% 1/10W				
R500	1-216-073-00	RES,CHIP	10K 5% 1/10W				
R501	1-216-057-00	RES,CHIP	2.2K 5% 1/10W				

<VARIABLE RESISTOR>

RV301 1-241-759-11 RES, ADJ, CERMET 220
RV302 1-241-759-11 RES, ADJ, CERMET 220
RV303 1-241-759-11 RES, ADJ, CERMET 220
RV304 1-241-767-21 RES, ADJ, CARBON 100K

<SWITCH>

SW201 1-570-865-11 SWITCH, SLIDE

<CRYSTAL>

X401 1-579-511-21 VIBRATOR, CRYSTAL

* A-1135-813-A BA BOARD, COMPLETE

* 7-322-065-72 RUBBER, RTV (SE-9168) (130G)
7-682-949-01 SCREW +PSW 3X10

<BAND PASS FILTER>

BPF1 1-236-366-11 MODULE, TRAP
BPF2 1-236-365-11 MODULE, TRAP

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
<CAPACITOR>				C62	1-126-965-11	ELECT 22MF	20% 50V
C1	1-124-910-11	ELECT 47MF	20% 50V	C63	1-124-122-11	ELECT 100MF	20% 50V
C2	1-124-910-11	ELECT 47MF	20% 50V	C64	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C3	1-124-910-11	ELECT 47MF	20% 50V	C65	1-124-907-11	ELECT 10MF	20% 50V
C4	1-164-222-11	CERAMIC CHIP 0.22MF	25V	C67	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C5	1-102-112-00	CERAMIC 330PF	10% 50V	C68	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C8	1-124-122-11	ELECT 100MF	20% 50V	C69	1-163-119-00	CERAMIC CHIP 120PF	5% 50V
C9	1-124-122-11	ELECT 100MF	20% 50V	C70	1-163-133-00	CERAMIC CHIP 470PF	5% 50V
C10	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	C71	1-163-133-00	CERAMIC CHIP 470PF	5% 50V
C11	1-124-907-11	ELECT 10MF	20% 50V	C72	1-126-963-11	ELECT 4.7MF	20% 50V
C12	1-124-910-11	ELECT 47MF	20% 50V	C73	1-124-903-11	ELECT 1MF	20% 50V
C13	1-124-910-11	ELECT 47MF	20% 50V	C74	1-136-171-00	FILM 0.33MF	5% 50V
C14	1-124-910-11	ELECT 47MF	20% 50V	C75	1-136-161-00	FILM 0.047MF	5% 50V
C15	1-124-910-11	ELECT 47MF	20% 50V	C76	1-136-157-00	FILM 0.022MF	5% 50V
C16	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	C77	1-136-157-00	FILM 0.022MF	5% 50V
C17	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	C78	1-163-119-00	CERAMIC CHIP 120PF	5% 50V
C18	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	C79	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C19	1-126-965-11	ELECT 22MF	20% 50V	C81	1-126-963-11	ELECT 4.7MF	20% 50V
C20	1-124-910-11	ELECT 47MF	20% 50V	C82	1-110-518-91	ELECT 10MF	20% 100V
C21	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	C83	1-124-907-11	ELECT 10MF	20% 50V
C22	1-124-910-11	ELECT 47MF	20% 50V	C84	1-124-910-11	ELECT 47MF	20% 50V
C23	1-124-910-11	ELECT 47MF	20% 50V	C85	1-124-907-11	ELECT 10MF	20% 50V
C24	1-163-031-11	CERAMIC CHIP 0.01MF	50V	C86	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C25	1-124-907-11	ELECT 10MF	20% 50V	C88	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C28	1-163-035-00	CERAMIC CHIP 0.047MF	50V	C89	1-164-161-11	CERAMIC CHIP 0.0022MF	50V
C29	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	C91	1-163-245-11	CERAMIC CHIP 56PF	5% 50V
C30	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V	C104	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C31	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	C106	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V
C32	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V	C201	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C33	1-124-907-11	ELECT 10MF	20% 50V	C202	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C34	1-163-109-00	CERAMIC CHIP 47PF	5% 50V	C203	1-136-157-00	FILM 0.022MF	5% 50V
C35	1-163-093-00	CERAMIC CHIP 10PF	5% 50V	C205	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C36	1-163-117-00	CERAMIC CHIP 100PF	5% 50V	C207	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V
C37	1-124-903-11	ELECT 1MF	20% 50V	C208	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C38	1-124-907-11	ELECT 10MF	20% 50V	C211	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C39	1-163-115-00	CERAMIC CHIP 82PF	5% 50V	C212	1-163-224-11	CERAMIC CHIP 7PF	0.25PF 50V
C40	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V	C213	1-124-122-11	ELECT 100MF	20% 50V
C41	1-163-031-11	CERAMIC CHIP 0.01MF	50V	C214	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C42	1-163-237-11	CERAMIC CHIP 27PF	5% 50V	C215	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C43	1-124-907-11	ELECT 10MF	20% 50V	C216	1-124-122-11	ELECT 100MF	20% 50V
C44	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V	C217	1-124-122-11	ELECT 100MF	20% 50V
C45	1-163-245-11	CERAMIC CHIP 56PF	5% 50V	C218	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C46	1-124-119-00	ELECT 330MF	20% 16V	C219	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C47	1-124-119-00	ELECT 330MF	20% 16V	C220	1-124-122-11	ELECT 100MF	20% 50V
C48	1-163-035-00	CERAMIC CHIP 0.047MF	50V	C221	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C49	1-136-153-00	FILM 0.01MF	5% 50V	C222	1-124-122-11	ELECT 100MF	20% 50V
C50	1-163-033-91	CERAMIC CHIP 0.022MF	50V	C223	1-124-122-11	ELECT 100MF	20% 50V
C51	1-163-031-11	CERAMIC CHIP 0.01MF	50V	C224	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C52	1-163-119-00	CERAMIC CHIP 120PF	5% 50V	C229	1-124-907-11	ELECT 10MF	20% 50V
C53	1-163-241-11	CERAMIC CHIP 39PF	5% 50V	C230	1-124-122-11	ELECT 100MF	20% 50V
C54	1-163-233-11	CERAMIC CHIP 18PF	5% 50V	C231	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C55	1-163-125-00	CERAMIC CHIP 220PF	5% 50V	C234	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C56	1-163-233-11	CERAMIC CHIP 18PF	5% 50V	C235	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C57	1-163-119-00	CERAMIC CHIP 120PF	5% 50V	C236	1-124-907-11	ELECT 10MF	20% 50V
C58	1-163-113-00	CERAMIC CHIP 68PF	5% 50V	C237	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C59	1-163-125-00	CERAMIC CHIP 220PF	5% 50V	C238	1-124-907-11	ELECT 10MF	20% 50V
C60	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V	C239	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V
C61	1-126-965-11	ELECT 22MF	20% 50V	C240	1-163-021-91	CERAMIC CHIP 0.01MF	10% 50V

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
C241	1-126-963-11	ELECT	4.7MF 20% 50V	<TRIMMER>			
C242	1-124-907-11	ELECT	10MF 20% 50V	CT101	1-141-181-11	CAP, 1 GANG TRIMMER 30PF	
C243	1-124-907-11	ELECT	10MF 20% 50V	CT102	1-141-181-11	CAP, 1 GANG TRIMMER 30PF	
C244	1-128-551-11	ELECT	22MF 20% 25V	<DIODE>			
C301	1-164-004-11	CERAMIC CHIP	0.1MF 10% 25V	D1	8-719-801-78	DIODE 1SS184	
C302	1-163-021-91	CERAMIC CHIP	0.01MF 10% 50V	D2	8-719-801-78	DIODE 1SS184	
C303	1-126-965-11	ELECT	22MF 20% 50V	D3	8-719-801-78	DIODE 1SS184	
C304	1-163-227-11	CERAMIC CHIP	10PF 0.5PF 50V	D4	8-719-801-78	DIODE 1SS184	
C305	1-126-965-11	ELECT	22MF 20% 50V	D5	8-719-801-78	DIODE 1SS184	
C307	1-136-169-00	FILM	0.22MF 5% 50V	D6	8-719-104-34	DIODE 1S2836	
C308	1-124-902-00	ELECT	0.47MF 20% 50V	D7	8-719-801-78	DIODE 1SS184	
C309	1-124-902-00	ELECT	0.47MF 20% 50V	D8	8-719-106-71	DIODE RD12M-B2	
C310	1-124-902-00	ELECT	0.47MF 20% 50V	D9	8-719-801-78	DIODE 1SS184	
C311	1-126-965-11	ELECT	22MF 20% 50V	D10	8-719-801-78	DIODE 1SS184	
C312	1-124-910-11	ELECT	47MF 20% 50V	D12	8-719-801-78	DIODE 1SS184	
C313	1-124-910-11	ELECT	47MF 20% 50V	D13	8-719-801-78	DIODE 1SS184	
C316	1-137-194-91	FILM	0.47MF 5% 50V	D14	8-719-801-78	DIODE 1SS184	
C317	1-107-910-11	ELECT	100MF 20% 35V	D101	8-719-105-46	DIODE RD3.3M-B2	
C318	1-107-888-11	ELECT	47MF 20% 25V	D102	8-719-105-82	DIODE RD5.1M-B2	
C319	1-163-021-91	CERAMIC CHIP	0.01MF 10% 50V	D103	8-719-104-34	DIODE 1S2836	
C321	1-107-910-11	ELECT	100MF 20% 35V	D107	8-719-801-78	DIODE 1SS184	
C322	1-163-021-91	CERAMIC CHIP	0.01MF 10% 50V	D108	8-719-900-95	DIODE V09G	
C323	1-124-907-11	ELECT	10MF 20% 50V	D110	8-719-105-99	DIODE RD6.2M-B1	
C324	1-107-910-11	ELECT	100MF 20% 35V	D112	8-719-801-78	DIODE 1SS184	
C326	1-124-907-11	ELECT	10MF 20% 50V	D113	8-719-801-78	DIODE 1SS184	
C327	1-124-907-11	ELECT	10MF 20% 50V	D118	8-719-104-34	DIODE 1S2836	
C328	1-124-907-11	ELECT	10MF 20% 50V	D119	8-719-801-78	DIODE 1SS184	
C330	1-163-105-00	CERAMIC CHIP	33PF 5% 50V	D130	8-719-801-78	DIODE 1SS184	
C331	1-136-177-00	FILM	1MF 5% 50V	D201	8-719-801-78	DIODE 1SS184	
C332	1-124-902-00	ELECT	0.47MF 20% 50V	D301	8-719-801-78	DIODE 1SS184	
C333	1-124-907-11	ELECT	10MF 20% 50V	D303	8-719-801-78	DIODE 1SS184	
C334	1-124-910-11	ELECT	47MF 20% 50V	D304	8-719-105-63	DIODE RD4.3M-B1	
C335	1-163-021-91	CERAMIC CHIP	0.01MF 10% 50V	D305	8-719-106-17	DIODE RD6.8M-B2	
C337	1-163-089-00	CERAMIC CHIP	6PF 0.25PF 50V	<DELAY LINE>			
C338	1-124-907-11	ELECT	10MF 20% 50V	DL101	1-415-122-31	DELAY LINE, 1H (PAL)	
C340	1-128-551-11	ELECT	22MF 20% 25V	DL102	1-415-632-11	DELAY LINE, Y	
C341	1-107-888-11	ELECT	47MF 20% 25V	DL103	1-415-502-11	DELAY LINE	
C342	1-107-910-11	ELECT	100MF 20% 35V	<FILTER>			
C343	1-124-910-11	ELECT	47MF 20% 50V	FL1	1-236-164-11	ENCAPSULATED COMPONENT	
C346	1-124-907-11	ELECT	10MF 20% 50V	FL2	1-239-397-11	FILTER, LOW PASS	
C347	1-163-021-91	CERAMIC CHIP	0.01MF 10% 50V	FL3	1-239-397-11	FILTER, LOW PASS	
C348	1-163-021-91	CERAMIC CHIP	0.01MF 10% 50V	FL4	1-239-397-11	FILTER, LOW PASS	
C349	1-107-888-11	ELECT	47MF 20% 25V	<IC>			
C351	1-163-021-91	CERAMIC CHIP	0.01MF 10% 50V	IC1	8-759-009-07	IC MC14053BF	
C352	1-163-021-91	CERAMIC CHIP	0.01MF 10% 50V	IC2	8-759-513-47	IC TDA4555/V1	
C353	1-163-021-91	CERAMIC CHIP	0.01MF 10% 50V	IC3	8-759-932-16	IC TDA4565	
C354	1-163-009-11	CERAMIC CHIP	0.001MF 10% 50V	IC4	8-759-009-07	IC MC14053BF	
C399	1-128-551-11	ELECT	22MF 20% 25V	IC5	8-759-710-42	IC NJM2228M	
<CONNECTOR>				IC6	8-759-231-00	DIODE TA7348P	
CN201*1-566-056-11	PIN, CONNECTOR	4P		IC7	8-759-231-00	DIODE TA7348P	
CN202*1-566-056-11	PIN, CONNECTOR	4P					
CN203*1-566-061-11	PIN, CONNECTOR	9P					
CN204*1-566-059-11	PIN, CONNECTOR	7P					
CN205*1-566-060-11	PIN, CONNECTOR	8P					
CN206*1-566-057-11	PIN, CONNECTOR	5P					

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
IC8	8-752-034-85	IC CXA1216P		Q25	1-801-806-11	TRANSISTOR DTC144EK-T146	
IC10	8-741-765-21	HYB IC SBX1765-01		Q26	8-729-230-49	TRANSISTOR 2SC2712-YG	
IC11	8-759-979-16	IC CX-7916		Q27	8-729-230-49	TRANSISTOR 2SC2712-YG	
IC12	8-752-037-15	IC CXA1387S		Q28	1-801-806-11	TRANSISTOR DTC144EK-T146	
IC13	8-759-701-59	IC NJM78M09FA		Q29	8-729-216-22	TRANSISTOR 2SA1162-G	
IC14	8-759-700-69	IC NJM79L12A		Q30	8-729-230-49	TRANSISTOR 2SC2712-YG	
IC15	1-809-576-11	MODULE, H8B7178B		Q33	8-729-230-49	TRANSISTOR 2SC2712-YG	
IC16	8-759-231-58	IC TA7812S		Q35	1-801-806-11	TRANSISTOR DTC144EK-T146	
IC17	8-759-701-75	IC NJM7805FA		Q36	8-729-216-22	TRANSISTOR 2SA1162-G	
		<CHIP CONDUCTOR>		Q37	1-801-806-11	TRANSISTOR DTC144EK-T146	
JR1	1-216-295-91	SHORT	0	Q38	1-801-806-11	TRANSISTOR DTC144EK-T146	
JR2	1-216-295-91	SHORT	0	Q39	8-729-116-06	TRANSISTOR 2SK160-K6	
		<COIL>		Q40	8-729-116-06	TRANSISTOR 2SK160-K6	
L101	1-410-470-11	INDUCTOR 10UH		Q41	1-801-806-11	TRANSISTOR DTC144EK-T146	
L103	1-410-466-41	INDUCTOR 4.7UH		Q42	1-801-806-11	TRANSISTOR DTC144EK-T146	
L104	1-408-600-31	INDUCTOR 5.6UH		Q43	1-801-806-11	TRANSISTOR DTC144EK-T146	
L105	1-404-539-11	COIL		Q44	1-801-806-11	TRANSISTOR DTC144EK-T146	
L106	1-404-554-11	COIL		Q45	1-801-806-11	TRANSISTOR DTC144EK-T146	
L107	1-404-554-11	COIL		Q52	8-729-230-49	TRANSISTOR 2SC2712-YG	
L108	1-404-554-11	COIL		Q118	8-729-230-49	TRANSISTOR 2SC2712-YG	
L109	1-408-397-00	INDUCTOR 1UH		Q119	8-729-230-49	TRANSISTOR 2SC2712-YG	
L110	1-410-466-41	INDUCTOR 4.7UH		Q120	8-729-230-49	TRANSISTOR 2SC2712-YG	
L111	1-410-466-41	INDUCTOR 4.7UH		Q201	1-801-806-11	TRANSISTOR DTC144EK-T146	
L112	1-410-466-41	INDUCTOR 4.7UH		Q202	8-729-230-49	TRANSISTOR 2SC2712-YG	
L113	1-459-155-00	COIL (WITH CORE) 45UH		Q203	8-729-230-49	TRANSISTOR 2SC2712-YG	
L114	1-459-155-00	COIL (WITH CORE) 45UH		Q204	1-801-806-11	TRANSISTOR DTC144EK-T146	
L116	1-410-466-41	INDUCTOR 4.7UH		Q205	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
L120	1-404-584-11	COIL		Q206	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
L201	1-408-773-31	INDUCTOR CHIP 4.7UH		Q207	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
		<TRANSISTOR>		Q208	1-801-806-11	TRANSISTOR DTC144EK-T146	
Q1	1-801-806-11	TRANSISTOR DTC144EK-T146		Q209	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q2	1-801-806-11	TRANSISTOR DTC144EK-T146		Q210	8-729-216-22	TRANSISTOR 2SA1162-G	
Q3	8-729-230-49	TRANSISTOR 2SC2712-YG		Q212	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q4	1-801-806-11	TRANSISTOR DTC144EK-T146		Q213	8-729-216-22	TRANSISTOR 2SA1162-G	
Q7	8-729-230-49	TRANSISTOR 2SC2712-YG		Q301	1-801-806-11	TRANSISTOR DTC144EK-T146	
Q8	1-801-806-11	TRANSISTOR DTC144EK-T146		Q302	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q9	8-729-230-49	TRANSISTOR 2SC2712-YG		Q303	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q10	8-729-230-49	TRANSISTOR 2SC2712-YG		Q304	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q11	8-729-230-49	TRANSISTOR 2SC2712-YG		Q305	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q12	8-729-216-22	TRANSISTOR 2SA1162-G		Q306	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q13	8-729-230-49	TRANSISTOR 2SC2712-YG		Q307	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q14	8-729-230-49	TRANSISTOR 2SC2712-YG		Q308	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q15	1-801-806-11	TRANSISTOR DTC144EK-T146		Q309	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q16	1-801-806-11	TRANSISTOR DTC144EK-T146		Q310	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q17	8-729-230-49	TRANSISTOR 2SC2712-YG		Q311	1-801-806-11	TRANSISTOR DTC144EK-T146	
Q18	8-729-120-28	TRANSISTOR 2SC1623-L5L6		Q312	1-801-806-11	TRANSISTOR DTC144EK-T146	
Q19	8-729-216-22	TRANSISTOR 2SA1162-G		Q313	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q20	8-729-120-28	TRANSISTOR 2SC1623-L5L6		Q314	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q21	1-801-806-11	TRANSISTOR DTC144EK-T146		Q315	1-801-806-11	TRANSISTOR DTC144EK-T146	
Q22	1-801-806-11	TRANSISTOR DTC144EK-T146		Q317	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q23	1-801-806-11	TRANSISTOR DTC144EK-T146		Q318	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q24	1-801-806-11	TRANSISTOR DTC144EK-T146		Q321	1-801-806-11	TRANSISTOR DTC144EK-T146	
				Q323	8-729-230-49	TRANSISTOR 2SC2712-YG	
				Q324	8-729-230-49	TRANSISTOR 2SC2712-YG	
				Q325	1-801-806-11	TRANSISTOR DTC144EK-T146	
				Q326	1-801-806-11	TRANSISTOR DTC144EK-T146	
				Q327	8-729-230-49	TRANSISTOR 2SC2712-YG	
				Q328	8-729-216-22	TRANSISTOR 2SA1162-G	

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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R126	1-216-650-11	METAL CHIP	910 0.50%1/10W	R303	1-216-017-91	RES,CHIP	47 5% 1/10W
R127	1-216-645-11	METAL CHIP	560 0.50%1/10W	R304	1-216-119-00	RES,CHIP	820K 5% 1/10W
				R305	1-216-049-91	RES,CHIP	1K 5% 1/10W
R128	1-216-643-11	METAL CHIP	470 0.50%1/10W	R306	1-216-691-11	METAL CHIP	47K 0.50%1/10W
R129	1-216-635-11	METAL CHIP	220 0.50%1/10W				
R130	1-216-073-00	RES,CHIP	10K 5% 1/10W	R307	1-216-109-00	RES,CHIP	330K 5% 1/10W
R131	1-216-665-11	METAL CHIP	3.9K 0.50%1/10W	R308	1-216-627-11	METAL CHIP	100 0.50%1/10W
R132	1-216-051-00	RES,CHIP	1.2K 5% 1/10W	R309	1-216-017-91	RES,CHIP	47 5% 1/10W
				R310	1-216-017-91	RES,CHIP	47 5% 1/10W
R133	1-216-049-91	RES,CHIP	1K 5% 1/10W	R311	1-216-017-91	RES,CHIP	47 5% 1/10W
R134	1-216-627-11	METAL CHIP	100 0.50%1/10W				
R135	1-216-001-00	RES,CHIP	10 5% 1/10W	R312	1-216-017-91	RES,CHIP	47 5% 1/10W
R141	1-216-049-91	RES,CHIP	1K 5% 1/10W	R313	1-216-017-91	RES,CHIP	47 5% 1/10W
R148	1-216-683-11	METAL CHIP	22K 0.50%1/10W	R314	1-216-057-00	RES,CHIP	2.2K 5% 1/10W
				R315	1-216-067-00	RES,CHIP	5.6K 5% 1/10W
R201	1-216-073-00	RES,CHIP	10K 5% 1/10W	R316	1-216-061-00	RES,CHIP	3.3K 5% 1/10W
R202	1-216-073-00	RES,CHIP	10K 5% 1/10W				
R203	1-216-051-00	RES,CHIP	1.2K 5% 1/10W	R317	1-216-055-00	RES,CHIP	1.8K 5% 1/10W
R204	1-216-073-00	RES,CHIP	10K 5% 1/10W	R318	1-216-667-11	METAL CHIP	4.7K 0.50%1/10W
R205	1-216-073-00	RES,CHIP	10K 5% 1/10W	R319	1-216-017-91	RES,CHIP	47 5% 1/10W
				R320	1-216-631-11	METAL CHIP	150 0.50%1/10W
R206	1-216-073-00	RES,CHIP	10K 5% 1/10W	R321	1-216-073-00	RES,CHIP	10K 5% 1/10W
R207	1-216-683-11	METAL CHIP	22K 0.50%1/10W				
R208	1-216-049-91	RES,CHIP	1K 5% 1/10W	R322	1-216-017-91	RES,CHIP	47 5% 1/10W
R209	1-216-013-00	RES,CHIP	33 5% 1/10W	R323	1-216-057-00	RES,CHIP	2.2K 5% 1/10W
R210	1-216-045-00	RES,CHIP	680 5% 1/10W	R324	1-216-017-91	RES,CHIP	47 5% 1/10W
				R325	1-216-049-91	RES,CHIP	1K 5% 1/10W
R211	1-216-037-00	RES,CHIP	330 5% 1/10W	R326	1-216-640-11	METAL CHIP	360 0.50%1/10W
R212	1-216-683-11	METAL CHIP	22K 0.50%1/10W				
R213	1-216-073-00	RES,CHIP	10K 5% 1/10W	R327	1-216-640-11	METAL CHIP	360 0.50%1/10W
R214	1-216-049-91	RES,CHIP	1K 5% 1/10W	R328	1-216-061-00	RES,CHIP	3.3K 5% 1/10W
R215	1-216-037-00	RES,CHIP	330 5% 1/10W	R329	1-216-061-00	RES,CHIP	3.3K 5% 1/10W
				R330	1-216-061-00	RES,CHIP	3.3K 5% 1/10W
R216	1-216-013-00	RES,CHIP	33 5% 1/10W	R331	1-216-073-00	RES,CHIP	10K 5% 1/10W
R217	1-216-663-11	METAL CHIP	3.3K 0.50%1/10W				
R218	1-216-639-11	METAL CHIP	330 0.50%1/10W	R332	1-216-073-00	RES,CHIP	10K 5% 1/10W
R219	1-216-023-00	RES,CHIP	82 5% 1/10W	R333	1-216-061-00	RES,CHIP	3.3K 5% 1/10W
R220	1-216-045-00	RES,CHIP	680 5% 1/10W	R334	1-216-061-00	RES,CHIP	3.3K 5% 1/10W
				R335	1-216-073-00	RES,CHIP	10K 5% 1/10W
R221	1-216-035-00	RES,CHIP	270 5% 1/10W	R336	1-216-691-11	METAL CHIP	47K 0.50%1/10W
R222	1-216-627-11	METAL CHIP	100 0.50%1/10W				
R223	1-216-035-00	RES,CHIP	270 5% 1/10W	R337	1-216-691-11	METAL CHIP	47K 0.50%1/10W
R224	1-216-085-00	RES,CHIP	33K 5% 1/10W	R338	1-216-017-91	RES,CHIP	47 5% 1/10W
R225	1-216-075-00	RES,CHIP	12K 5% 1/10W	R339	1-216-049-91	RES,CHIP	1K 5% 1/10W
				R340	1-216-049-91	RES,CHIP	1K 5% 1/10W
R226	1-216-077-00	RES,CHIP	15K 5% 1/10W	R341	1-216-017-91	RES,CHIP	47 5% 1/10W
R227	1-216-057-00	RES,CHIP	2.2K 5% 1/10W				
R228	1-216-043-91	RES,CHIP	560 5% 1/10W	R342	1-216-049-91	RES,CHIP	1K 5% 1/10W
R229	1-216-049-91	RES,CHIP	1K 5% 1/10W	R343	1-216-017-91	RES,CHIP	47 5% 1/10W
R230	1-216-691-11	METAL CHIP	47K 0.50%1/10W	R344	1-216-049-91	RES,CHIP	1K 5% 1/10W
				R345	1-216-049-91	RES,CHIP	1K 5% 1/10W
R231	1-216-079-00	RES,CHIP	18K 5% 1/10W	R346	1-216-697-91	METAL CHIP	82K 0.50%1/10W
R232	1-216-627-11	METAL CHIP	100 0.50%1/10W				
R233	1-216-641-11	METAL CHIP	390 0.50%1/10W	R347	1-216-673-11	METAL CHIP	8.2K 0.50%1/10W
R234	1-216-085-00	RES,CHIP	33K 5% 1/10W	R348	1-216-049-91	RES,CHIP	1K 5% 1/10W
R235	1-216-075-00	RES,CHIP	12K 5% 1/10W	R349	1-216-677-11	METAL CHIP	12K 0.50%1/10W
				R350	1-216-001-00	RES,CHIP	10 5% 1/10W
R236	1-216-057-00	RES,CHIP	2.2K 5% 1/10W	R351	1-216-095-00	RES,CHIP	82K 5% 1/10W
R237	1-216-077-00	RES,CHIP	15K 5% 1/10W				
R238	1-216-043-91	RES,CHIP	560 5% 1/10W	R352	1-216-691-11	METAL CHIP	47K 0.50%1/10W
R239	1-216-627-11	METAL CHIP	100 0.50%1/10W	R353	1-216-097-91	RES,CHIP	100K 5% 1/10W
R240	1-216-627-11	METAL CHIP	100 0.50%1/10W	R354	1-216-001-00	RES,CHIP	10 5% 1/10W
				R355	1-216-073-00	RES,CHIP	10K 5% 1/10W
R241	1-216-045-00	RES,CHIP	680 5% 1/10W	R356	1-216-049-91	RES,CHIP	1K 5% 1/10W
R242	1-216-295-91	SHORT	0				
R243	1-216-295-91	SHORT	0	R357	1-216-683-11	METAL CHIP	22K 0.50%1/10W
R290	1-216-097-91	RES,CHIP	100K 5% 1/10W	R358	1-216-073-00	RES,CHIP	10K 5% 1/10W
R301	1-216-073-00	RES,CHIP	10K 5% 1/10W	R359	1-216-017-91	RES,CHIP	47 5% 1/10W
				R360	1-216-095-00	RES,CHIP	82K 5% 1/10W
R302	1-216-017-91	RES,CHIP	47 5% 1/10W	R361	1-216-053-00	RES,CHIP	1.5K 5% 1/10W

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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
* A-1190-233-A PA BOARD, COMPLETE ***** (INCLUDING PB BOARD)				C51	1-123-024-21 ELECT	33MF	160V
				C52	1-104-999-11 FILM	0.1MF	5% 200V
				C53	1-162-134-11 CERAMIC	470PF	10% 2KV
				C54	1-107-675-11 ELECT	1MF	20% 160V
* 4-032-770-81 HEAT SINK, V-OUT				C55	1-124-119-00 ELECT	330MF	20% 16V
4-057-640-01 COVER, VOLUME (FOR RV1 and RV2)				C56	1-136-165-00 FILM	0.1MF	5% 50V
4-383-022-01 SPACER, MICA				C57	1-136-165-00 FILM	0.1MF	5% 50V
4-383-023-01 SPACER, MICA				C58	1-124-903-11 ELECT	1MF	20% 50V
* 7-322-065-72 RUBBER, RTV (SE-9168) (130G)				C59	1-107-661-11 ELECT	10MF	20% 350V
7-682-950-01 SCREW +PSW 3X12				C90	1-104-663-11 ELECT	33MF	20% 16V
<CAPACITOR>				<DIODE>			
C1	1-107-636-11 ELECT	10MF	20% 160V	D1	8-719-928-08 DIODE ERD28-08S		
C2	1-123-024-21 ELECT	33MF	160V	D2	8-719-300-80 DIODE RU-1C		
C3	1-136-134-00 FILM	1.5MF	5% 400V	D3	8-719-300-80 DIODE RU-1C		
C4	1-104-997-51 FILM	0.047MF	5% 200V	D4	8-719-300-80 DIODE RU-1C		
C5	1-102-030-00 CERAMIC	330PF	10% 500V	D7	8-719-901-19 DIODE V11N		
C6	1-124-907-11 ELECT	10MF	20% 50V	D8	8-719-971-20 DIODE ERC38-06		
C7	1-104-665-11 ELECT	100MF	20% 16V	D9	8-719-971-20 DIODE ERC38-06		
C9	1-124-902-00 ELECT	0.47MF	20% 50V	D10	8-719-971-20 DIODE ERC38-06		
C10	1-102-973-00 CERAMIC	100PF	5% 50V	D11	8-719-971-20 DIODE ERC38-06		
C11	1-102-244-00 CERAMIC	220PF	10% 500V	D12	8-719-971-20 DIODE ERC38-06		
C12	1-104-999-11 FILM	0.1MF	5% 200V	D13	8-719-971-20 DIODE ERC38-06		
C13	1-124-902-00 ELECT	0.47MF	20% 50V	D14	8-719-945-80 DIODE ERC06-15S		
C14	1-102-973-00 CERAMIC	100PF	5% 50V	D15	8-719-109-85 DIODE RD5.1ESB2		
C15	1-102-244-00 CERAMIC	220PF	10% 500V	D16	8-719-109-85 DIODE RD5.1ESB2		
C16	1-104-999-11 FILM	0.1MF	5% 200V	D17	8-719-109-85 DIODE RD5.1ESB2		
C17	1-124-903-11 ELECT	1MF	20% 50V	D18	8-719-109-85 DIODE RD5.1ESB2		
C18	1-124-903-11 ELECT	1MF	20% 50V	D20	8-719-911-19 DIODE 1SS119-25		
C19	1-162-134-11 CERAMIC	470PF	10% 2KV	D21	8-719-911-19 DIODE 1SS119-25		
C20	1-107-664-11 ELECT	47MF	20% 350V	D22	8-719-911-19 DIODE 1SS119-25		
C22	1-137-399-11 FILM	0.1MF	5% 100V	D23	8-719-911-19 DIODE 1SS119-25		
C23	1-124-907-11 ELECT	10MF	20% 50V	D24	8-719-911-19 DIODE 1SS119-25		
C24	1-124-907-11 ELECT	10MF	20% 50V	D25	8-719-911-19 DIODE 1SS119-25		
C25	1-104-663-11 ELECT	33MF	20% 16V	D26	8-719-911-19 DIODE 1SS119-25		
C26	1-124-907-11 ELECT	10MF	20% 50V	D28	8-719-911-19 DIODE 1SS119-25		
C27	1-124-907-11 ELECT	10MF	20% 50V	D29	8-719-911-19 DIODE 1SS119-25		
C28	1-104-663-11 ELECT	33MF	20% 16V	D30	8-719-911-19 DIODE 1SS119-25		
C29	1-104-663-11 ELECT	33MF	20% 16V	D31	8-719-911-19 DIODE 1SS119-25		
C30	1-136-169-00 FILM	0.22MF	5% 50V	D32	8-719-911-19 DIODE 1SS119-25		
C31	1-124-907-11 ELECT	10MF	20% 50V	D33	8-719-110-36 DIODE RD13ESB2		
C32	1-104-663-11 ELECT	33MF	20% 16V	D90	8-719-911-19 DIODE 1SS119-25		
C33	1-124-907-11 ELECT	10MF	20% 50V	<IC>			
C34	1-104-666-11 ELECT	220MF	20% 16V	IC1	8-759-503-91 IC TL082ACP		
C36	1-104-993-11 FILM	0.01MF	5% 200V	IC2	8-759-103-93 IC uPC393C		
C37	1-124-907-11 ELECT	10MF	20% 50V	IC3	8-759-103-93 IC uPC393C		
C39	1-102-824-00 CERAMIC	470PF	5% 50V	IC4	8-759-634-50 IC M5218AL		
C40	1-104-996-91 FILM	0.033MF	5% 200V	IC5	8-759-708-12 IC NJM78L12A		
C41	1-104-996-91 FILM	0.033MF	5% 200V	<COIL>			
C42	1-104-666-11 ELECT	220MF	20% 16V	L2	1-459-700-11 INDUCTOR 0UH		
C43	1-104-666-11 ELECT	220MF	20% 16V	L3	1-459-155-00 COIL (WITH CORE) 45UH		
C44	1-126-768-11 ELECT	2200MF	20% 16V				
C45	1-126-768-11 ELECT	2200MF	20% 16V				
C46	1-107-635-11 ELECT	4.7MF	20% 160V				
C47	1-126-963-11 ELECT	4.7MF	20% 50V				
C48	1-126-963-11 ELECT	4.7MF	20% 50V				
C49	1-101-006-00 CERAMIC	0.047MF	50V				
C50	1-101-006-00 CERAMIC	0.047MF	50V				

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
<NEON LAMP>				R17	1-216-359-00	METAL OXIDE 6.8	5% 1W F
NL2	1-519-108-99	LAMP, NEON		R18	1-215-443-00	METAL 8.2K	1% 1/4W
<CONNECTOR>				R19	1-215-443-00	METAL 8.2K	1% 1/4W
PA1	* 1-566-058-11	PIN, CONNECTOR 6P		R20	1-215-441-00	METAL 6.8K	1% 1/4W
PA2	* 1-566-062-11	PIN, CONNECTOR 10P		R21	1-215-441-00	METAL 6.8K	1% 1/4W
PA3	* 1-508-768-00	PIN, CONNECTOR (5mm PITCH) 6P		R22	1-214-747-00	METAL 5.6K	1% 1/4W
PA4	* 1-566-056-11	PIN, CONNECTOR 4P		✕ R23 △	METAL		1/4W
PA5	* 1-566-057-11	PIN, CONNECTOR 5P		R24	1-214-777-00	METAL 100K	1% 1/4W
PA6	* 1-566-054-41	PIN, CONNECTOR 2P		R25	1-215-471-00	METAL 120K	1% 1/4W
PA7	* 1-566-055-11	PIN, CONNECTOR 3P		R26	1-215-471-00	METAL 120K	1% 1/4W
PA8	* 1-566-059-11	PIN, CONNECTOR 7P		R27	1-215-453-00	METAL 22K	1% 1/4W
PA9	* 1-566-058-11	PIN, CONNECTOR 6P		R28	1-247-843-11	CARBON 3.3K	5% 1/4W
PA10	* 1-566-058-11	PIN, CONNECTOR 6P		R29	1-247-863-91	CARBON 22K	5% 1/4W
PA11	* 1-566-058-11	PIN, CONNECTOR 6P		R30	1-249-429-11	CARBON 10K	5% 1/4W
PA12	* 1-508-786-00	PIN, CONNECTOR (5mm PITCH) 2P		R31	1-215-469-00	METAL 100K	1% 1/4W
PA13	* 1-508-786-00	PIN, CONNECTOR (5mm PITCH) 2P		R32	1-247-843-11	CARBON 3.3K	5% 1/4W
PA14	1-508-766-00	PIN, CONNECTOR (5mm PITCH) 4P		R33	1-215-429-00	METAL 2.2K	1% 1/4W
PA15	* 1-566-054-11	PIN, CONNECTOR 2P		R34	1-215-435-00	METAL 3.9K	1% 1/4W
PA16	* 1-566-058-11	PIN, CONNECTOR 6P		R35	1-247-843-11	CARBON 3.3K	5% 1/4W
<TRANSISTOR>				R36	1-249-417-11	CARBON 1K	5% 1/4W
Q1	8-729-201-62	TRANSISTOR 2SC2555-2		R37	1-247-883-00	CARBON 150K	5% 1/4W
Q2	8-729-119-80	TRANSISTOR 2SC2688-LK		✕ R38 △	CARBON		1/4W
Q3	8-729-119-80	TRANSISTOR 2SC2688-LK		R40	1-247-863-91	CARBON 22K	5% 1/4W
Q4	8-729-119-80	TRANSISTOR 2SC2688-LK		R41	1-249-435-11	CARBON 33K	5% 1/4W
Q5	8-729-823-07	TRANSISTOR 2SA1540-DE		R42	1-249-438-11	CARBON 56K	5% 1/4W
Q6	8-729-800-80	TRANSISTOR 2SD1399-CA		R43	1-249-434-11	CARBON 27K	5% 1/4W
Q7	8-729-119-76	TRANSISTOR 2SA1175-HFE		R44	1-249-429-11	CARBON 10K	5% 1/4W
Q8	8-729-119-78	TRANSISTOR 2SC2785-HFE		R45	1-247-843-11	CARBON 3.3K	5% 1/4W
Q9	8-729-119-78	TRANSISTOR 2SC2785-HFE		R46	1-215-453-00	METAL 22K	1% 1/4W
Q10	8-729-119-78	TRANSISTOR 2SC2785-HFE		R47	1-215-455-00	METAL 27K	1% 1/4W
Q11	8-729-119-78	TRANSISTOR 2SC2785-HFE		✕ R48 △	CARBON		1/4W
Q12	8-729-119-78	TRANSISTOR 2SC2785-HFE		R50	1-215-469-00	METAL 100K	1% 1/4W
Q13	8-729-804-48	TRANSISTOR 2SC3675		R51	1-215-469-00	METAL 100K	1% 1/4W
Q14	8-729-119-76	TRANSISTOR 2SA1175-HFE		R52	1-249-430-11	CARBON 12K	5% 1/4W
Q90	8-729-030-02	TRANSISTOR DTC144ESA		R53	1-247-863-91	CARBON 22K	5% 1/4W
Q91	8-729-900-65	TRANSISTOR DTA144ES		R54	1-247-863-91	CARBON 22K	5% 1/4W
<RESISTOR>				R55	1-249-430-11	CARBON 12K	5% 1/4W
JW38	1-249-429-11	CARBON 10K	5% 1/4W	R56	1-249-419-11	CARBON 1.5K	5% 1/4W
R1	1-216-378-11	METAL OXIDE 5.6	5% 2W F	R57	1-249-377-11	CARBON 0.47	5% 1/4W F
R2	1-216-488-11	METAL OXIDE 18K	5% 3W F	R58	1-214-929-00	CARBON 470K	5% 1/2W
R3	1-249-429-11	CARBON 10K	5% 1/4W	R59	1-207-621-00	WIREWOUND 1.5	10% 2W F
R4	1-215-921-11	METAL OXIDE 4.7K	5% 3W F	R60	1-215-477-00	METAL 220K	1% 1/4W
R5	1-215-921-11	METAL OXIDE 4.7K	5% 3W F	R61	1-215-457-00	METAL 33K	1% 1/4W
R6	1-215-924-00	METAL OXIDE 15K	5% 3W F	R62	1-249-435-11	CARBON 33K	5% 1/4W
R7	1-249-417-11	CARBON 1K	5% 1/4W	R63	1-247-903-00	CARBON 1M	5% 1/4W
R9	1-249-417-11	CARBON 1K	5% 1/4W	R64	1-249-439-11	CARBON 68K	5% 1/4W
R10	1-247-843-11	CARBON 3.3K	5% 1/4W	R65	1-249-429-11	CARBON 10K	5% 1/4W
R11	1-249-420-11	CARBON 1.8K	5% 1/4W F	R66	1-247-807-31	CARBON 100	5% 1/4W
R12	1-249-421-11	CARBON 2.2K	5% 1/4W	R67	1-215-453-00	METAL 22K	1% 1/4W
R13	1-249-420-11	CARBON 1.8K	5% 1/4W F	R68	1-249-440-11	CARBON 82K	5% 1/4W
R15	1-249-441-11	CARBON 100K	5% 1/4W	R69	1-249-429-11	CARBON 10K	5% 1/4W
R16	1-249-441-11	CARBON 100K	5% 1/4W	R70	1-249-435-11	CARBON 33K	5% 1/4W
				R71	1-249-435-11	CARBON 33K	5% 1/4W
				R72	1-215-921-11	METAL OXIDE 4.7K	5% 3W F
				R73	1-247-881-00	CARBON 120K	5% 1/4W
				R74	1-249-429-11	CARBON 10K	5% 1/4W
				R75	1-202-730-00	SOLID 8.2M	10% 1/2W
				R76	1-216-488-11	METAL OXIDE 18K	5% 3W F
				R77	1-249-417-11	CARBON 1K	5% 1/4W

Ref.No.	Part No.	Description	Remark
R78	1-249-433-11	CARBON 22K 5% 1/4W F	
R79	1-215-483-00	METAL 390K 1% 1/4W	
R80	1-247-843-11	CARBON 3.3K 5% 1/4W	
R81	1-202-830-00	SOLID 10K 5% 1/2W	
R82	1-247-843-11	CARBON 3.3K 5% 1/4W	
R83	1-249-425-11	CARBON 4.7K 5% 1/4W	
R84	1-249-417-11	CARBON 1K 5% 1/4W	
R85	1-215-469-00	METAL 100K 1% 1/4W	
R86	1-215-469-00	METAL 100K 1% 1/4W	
R87	1-215-453-00	METAL 22K 1% 1/4W	
☒ R88	△	CARBON 1/4W	
☒ R89	△	CARBON 1/4W	
R90	1-249-417-11	CARBON 1K 5% 1/4W	
R91	1-249-429-11	CARBON 10K 5% 1/4W	
R92	1-249-429-11	CARBON 10K 5% 1/4W	
R95	1-249-417-11	CARBON 1K 5% 1/4W	
<VARIABLE RESISTOR>			
☒ RV1	△1-238-789-21	RES, ADJ, CERMET 50K	
☒ RV2	△1-238-788-21	RES, ADJ, CERMET 20K	
<SPARK GAP>			
SG1	1-519-063-XX	DISCHARGING GAP	
<TRANSFORMER>			
T1	1-437-078-00	TRANSFORMER, HORIZONTAL DRIVE	
T2	1-437-090-31	HDT	
T3	△1-437-078-11	TRANSFORMER, HORIZONTAL DRIVE	
T4	△1-439-409-11	LOT	
T5	△1-413-059-11	TRANSFORMER, FERRITE (DFT)	

* 1-621-054-11 PB BOARD			

* 7-322-065-72 RUBBER, RTV (SE-9168) (130G)			
<CAPACITOR>			
C1	1-128-579-11	ELECT 2.2MF 20% 100V	
C2	1-126-963-11	ELECT 4.7MF 20% 50V	
C3	1-136-159-00	FILM 0.033MF 5% 50V	
C5	1-102-106-00	CERAMIC 100PF 10% 50V	
C6	1-137-366-11	FILM 0.0022MF 5% 50V	
C7	1-126-964-11	ELECT 10MF 20% 50V	
C8	1-136-169-00	FILM 0.22MF 5% 50V	
C9	1-137-366-11	FILM 0.0022MF 5% 50V	
C10	1-126-964-11	ELECT 10MF 20% 50V	
<IC>			
IC1	8-759-100-75	IC uPC1394C	

Ref.No.	Part No.	Description	Remark
<RESISTOR>			
R2	1-249-417-11	CARBON 1K 5% 1/4W	
R3	1-249-434-11	CARBON 27K 5% 1/4W	
R4	1-249-431-11	CARBON 15K 5% 1/4W	
R5	1-249-441-11	CARBON 100K 5% 1/4W	
R6	1-249-435-11	CARBON 33K 5% 1/4W	
R7	1-249-429-11	CARBON 10K 5% 1/4W	
R8	1-249-413-11	CARBON 470 5% 1/4W	
R9	1-249-428-11	CARBON 8.2K 5% 1/4W	
R10	1-249-437-11	CARBON 47K 5% 1/4W	
R11	1-249-440-11	CARBON 82K 5% 1/4W	
R12	1-249-436-11	CARBON 39K 5% 1/4W	
R14	1-249-428-11	CARBON 8.2K 5% 1/4W	
<PLUG>			
W1	* 1-506-602-11	PLUG, L TYPE (2.0MM PITCH) 5P	
W2	* 1-506-602-11	PLUG, L TYPE (2.0MM PITCH) 5P	

* A-1190-234-A PD BOARD, COMPLETE			

* 4-032-770-81 HEAT SINK, V-OUT			
4-382-854-11 SCREW (M3X10), P, SW (+)			
<CAPACITOR>			
C1	1-107-635-11	ELECT 4.7MF 20% 160V	
C2	1-107-638-11	ELECT 33MF 20% 160V	
<CONNECTOR>			
CN100*1-566-058-11 PIN, CONNECTOR 6P			
<COIL>			
L1	1-459-614-11	INDUCTOR 0UH	
<TRANSISTOR>			
Q1	8-729-903-68	TRANSISTOR 2SD982	
<RESISTOR>			
R1	1-249-421-11	CARBON 2.2K 5% 1/4W F	

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
	* 1-672-044-11	FB BOARD *****				<DIODE>	
	1-533-223-11	HOLDER, FUSE		D1	8-719-503-06	DIODE S3WB60Z	
				D2	8-719-511-40	DIODE S1VB40	
				D3	8-719-933-09	DIODE AW01-33	
		<SWITCH>				<COIL>	
S1	△ 1-692-349-11	SWITCH, PUSH (AC POWER)		L1	△ 1-459-595-11	INDUCTOR 0UH (V20U)	
				L2	△ 1-411-532-11	INDUCTOR 0UH (V20M/V22M)	
				L2	△ 1-459-595-11	INDUCTOR 0UH (V20U)	
						<RESISTOR>	
	* 1-672-041-11	FC BOARD *****		R1	△ 1-202-723-51	SOLID 2.2M	10% 1/2W
	1-923-514-09	WIRE UL1672 AWG18 110MM BLK		R2	△ 1-205-798-11	CEMENTED 1.5	5% 20W
	1-923-514-10	WIRE UL1672 AWG18 150MM WHT		R3	1-214-921-00	CARBON 220K	5% 1/2W
				R4	1-214-921-00	CARBON 220K	5% 1/2W
				R5	1-247-807-31	CARBON 100	5% 1/4W
		<CONNECTOR>				<SWITCH>	
CN1	△ 1-580-375-11	INLET 3P		SW1	△ 1-570-971-11	SWITCH, SLIDE (V20U)	
						<TRANSFORMER>	
	* A-1241-348-A	FA BOARD, COMPLETE (V20M/V22M) *****		T1	△ 1-421-944-11	TRANSFORMER, LINE FILTER	
	* A-1241-349-A	FA BOARD, COMPLETE (V20U) *****		T2	△ 1-448-374-11	TRANSFORMER, POWER	
				T3	1-421-776-11	LFT	
						<VARISTOR>	
	* 1-508-765-00	PIN, CONNECTOR (5mm PITCH) 3P		VDR1	△ 1-806-355-41	VARISTOR AVR-G10D221KAHN (V20U)	
	* 1-508-786-00	PIN, CONNECTOR (5mm PITCH) 2P					
	* 1-566-055-11	PIN, CONNECTOR 3P					
	* 1-580-689-11	PIN, CONNECTOR (PC BOARD) 4P					
		<CAPACITOR>					
C1	△ 1-104-708-51	FILM 0.47MF 20% 250V (V20M/V22M)			* A-1270-344-A	QA BOARD, COMPLETE *****	
C1	△ 1-136-360-51	FILM 0.22MF 20% 250V (V20U)			* 7-322-065-72	RUBBER, RTV (SE-9168) (130G)	
C2	△ 1-136-360-51	FILM 0.22MF 20% 250V (V20U)				<CAPACITOR>	
C3	△ 1-136-360-51	FILM 0.22MF 20% 250V (V20U)		C1	1-104-663-11	ELECT 33MF 20% 16V	
C4	△ 1-113-924-51	CERAMIC 0.0047MF 20% 250V		C3	1-124-907-11	ELECT 10MF 20% 50V	
C5	△ 1-113-924-51	CERAMIC 0.0047MF 20% 250V		C4	1-163-035-00	CERAMIC CHIP 0.047MF 50V	
C6	1-113-920-11	CERAMIC 0.0022MF 20% 250V		C5	1-104-663-11	ELECT 33MF 20% 16V	
C7	1-113-920-11	CERAMIC 0.0022MF 20% 250V		C7	1-124-907-11	ELECT 10MF 20% 50V	
C8	1-125-469-11	ELECT (BLOCK)820MF 20% 200V (V20U)		C8	1-163-035-00	CERAMIC CHIP 0.047MF 50V	
C8	1-125-715-11	ELECT (BLOCK)820MF 20% 200V (V20M/V22M)		C9	1-104-663-11	ELECT 33MF 20% 16V	
C9	1-125-469-11	ELECT (BLOCK)820MF 20% 200V (V20U)		C11	1-124-907-11	ELECT 10MF 20% 50V	
C9	1-125-715-11	ELECT (BLOCK)820MF 20% 200V (V20M/V22M)		C12	1-163-035-00	CERAMIC CHIP 0.047MF 50V	
C10	1-101-003-00	CERAMIC 0.0047MF 50V		C13	1-104-663-11	ELECT 33MF 20% 16V	
C11	1-101-003-00	CERAMIC 0.0047MF 50V		C14	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C12	1-126-970-11	ELECT 330MF 20% 50V		C15	1-104-665-11	ELECT 100MF 20% 16V	
				C16	1-104-663-11	ELECT 33MF 20% 16V	
				C17	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
				C18	1-104-665-11	ELECT 100MF 20% 16V	

VPH-V20/V22

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
JR13	1-216-296-91	SHORT	0	<RESISTOR>			
JR14	1-216-296-91	SHORT	0	R1	1-215-394-00	METAL	75 1% 1/4W
JR15	1-216-295-91	SHORT	0	R2	1-216-083-00	RES,CHIP	27K 5% 1/10W
JR16	1-216-295-91	SHORT	0	R3	1-216-091-00	RES,CHIP	56K 5% 1/10W
JR17	1-216-295-91	SHORT	0	R4	1-216-025-91	RES,CHIP	100 5% 1/10W
JR18	1-216-296-91	SHORT	0	R5	1-216-057-00	RES,CHIP	2.2K 5% 1/10W
JR19	1-216-296-91	SHORT	0	R6	1-216-025-91	RES,CHIP	100 5% 1/10W
JR20	1-216-295-91	SHORT	0	R7	1-216-001-00	RES,CHIP	10 5% 1/10W
JR21	1-216-295-91	SHORT	0	R8	1-216-045-00	RES,CHIP	680 5% 1/10W
JR22	1-216-295-91	SHORT	0	R9	1-215-394-00	METAL	75 1% 1/4W
JR23	1-216-295-91	SHORT	0	R10	1-216-083-00	RES,CHIP	27K 5% 1/10W
JR25	1-216-295-91	SHORT	0	R11	1-216-091-00	RES,CHIP	56K 5% 1/10W
JR26	1-216-295-91	SHORT	0	R12	1-216-025-91	RES,CHIP	100 5% 1/10W
JR27	1-216-295-91	SHORT	0	R13	1-216-057-00	RES,CHIP	2.2K 5% 1/10W
JR28	1-216-295-91	SHORT	0	R14	1-216-025-91	RES,CHIP	100 5% 1/10W
JR29	1-216-295-91	SHORT	0	R15	1-216-001-00	RES,CHIP	10 5% 1/10W
JR31	1-216-295-91	SHORT	0	R16	1-216-045-00	RES,CHIP	680 5% 1/10W
<TRANSISTOR>				R17	1-215-394-00	METAL	75 1% 1/4W
Q1	8-729-230-49	TRANSISTOR 2SC2712-YG		R18	1-216-083-00	RES,CHIP	27K 5% 1/10W
Q2	8-729-230-49	TRANSISTOR 2SC2712-YG		R19	1-216-091-00	RES,CHIP	56K 5% 1/10W
Q3	8-729-230-49	TRANSISTOR 2SC2712-YG		R20	1-216-025-91	RES,CHIP	100 5% 1/10W
Q4	8-729-230-49	TRANSISTOR 2SC2712-YG		R21	1-216-057-00	RES,CHIP	2.2K 5% 1/10W
Q5	8-729-230-49	TRANSISTOR 2SC2712-YG		R22	1-216-025-91	RES,CHIP	100 5% 1/10W
Q6	8-729-230-49	TRANSISTOR 2SC2712-YG		R23	1-216-001-00	RES,CHIP	10 5% 1/10W
Q7	8-729-230-49	TRANSISTOR 2SC2712-YG		R24	1-216-045-00	RES,CHIP	680 5% 1/10W
Q8	8-729-230-49	TRANSISTOR 2SC2712-YG		R25	1-215-394-00	METAL	75 1% 1/4W
Q9	8-729-216-22	TRANSISTOR 2SA1162-G		R26	1-216-049-91	RES,CHIP	1K 5% 1/10W
Q10	1-801-806-11	TRANSISTOR DTC144EK-T146		R27	1-216-093-00	RES,CHIP	68K 5% 1/10W
Q11	8-729-216-22	TRANSISTOR 2SA1162-G		R28	1-216-055-00	RES,CHIP	1.8K 5% 1/10W
Q12	8-729-230-49	TRANSISTOR 2SC2712-YG		R29	1-216-089-91	RES,CHIP	47K 5% 1/10W
Q13	8-729-230-49	TRANSISTOR 2SC2712-YG		R30	1-215-394-00	METAL	75 1% 1/4W
Q14	8-729-230-49	TRANSISTOR 2SC2712-YG		R31	1-216-049-91	RES,CHIP	1K 5% 1/10W
Q15	1-801-806-11	TRANSISTOR DTC144EK-T146		R32	1-216-093-00	RES,CHIP	68K 5% 1/10W
Q16	8-729-230-49	TRANSISTOR 2SC2712-YG		R33	1-216-055-00	RES,CHIP	1.8K 5% 1/10W
Q17	8-729-230-49	TRANSISTOR 2SC2712-YG		R34	1-216-089-91	RES,CHIP	47K 5% 1/10W
Q18	8-729-119-78	TRANSISTOR 2SC2785-HFE		R35	1-216-035-00	RES,CHIP	270 5% 1/10W
Q19	1-801-806-11	TRANSISTOR DTC144EK-T146		R36	1-216-073-00	RES,CHIP	10K 5% 1/10W
Q20	1-801-806-11	TRANSISTOR DTC144EK-T146		R37	1-216-025-91	RES,CHIP	100 5% 1/10W
Q21	1-801-806-11	TRANSISTOR DTC144EK-T146		R38	1-216-089-91	RES,CHIP	47K 5% 1/10W
Q22	8-729-140-97	TRANSISTOR 2SB734-34		R39	1-216-089-91	RES,CHIP	47K 5% 1/10W
Q23	8-729-230-49	TRANSISTOR 2SC2712-YG		R40	1-216-091-00	RES,CHIP	56K 5% 1/10W
Q24	8-729-140-97	TRANSISTOR 2SB734-34		R41	1-216-049-91	RES,CHIP	1K 5% 1/10W
Q25	8-729-216-22	TRANSISTOR 2SA1162-G		R42	1-216-049-91	RES,CHIP	1K 5% 1/10W
Q26	8-729-216-22	TRANSISTOR 2SA1162-G		R43	1-216-049-91	RES,CHIP	1K 5% 1/10W
Q27	8-729-230-49	TRANSISTOR 2SC2712-YG		R44	1-216-061-00	RES,CHIP	3.3K 5% 1/10W
Q28	8-729-230-49	TRANSISTOR 2SC2712-YG		R45	1-216-053-00	RES,CHIP	1.5K 5% 1/10W
Q29	1-801-806-11	TRANSISTOR DTC144EK-T146		R46	1-216-061-00	RES,CHIP	3.3K 5% 1/10W
Q30	1-801-806-11	TRANSISTOR DTC144EK-T146		R47	1-216-067-00	RES,CHIP	5.6K 5% 1/10W
Q40	1-801-806-11	TRANSISTOR DTC144EK-T146		R48	1-216-049-91	RES,CHIP	1K 5% 1/10W
Q41	8-729-230-49	TRANSISTOR 2SC2712-YG		R49	1-216-021-00	RES,CHIP	68 5% 1/10W
Q42	8-729-230-49	TRANSISTOR 2SC2712-YG		R50	1-216-063-91	RES,CHIP	3.9K 5% 1/10W
Q43	8-729-230-49	TRANSISTOR 2SC2712-YG		R51	1-216-085-00	RES,CHIP	33K 5% 1/10W
Q44	8-729-230-49	TRANSISTOR 2SC2712-YG		R52	1-216-019-00	RES,CHIP	56 5% 1/10W
Q45	8-729-230-49	TRANSISTOR 2SC2712-YG		R53	1-216-049-91	RES,CHIP	1K 5% 1/10W
Q46	8-729-230-49	TRANSISTOR 2SC2712-YG		R54	1-216-049-91	RES,CHIP	1K 5% 1/10W
Q47	1-801-806-11	TRANSISTOR DTC144EK-T146		R55	1-216-011-00	RES,CHIP	27 5% 1/10W
				R56	1-216-011-00	RES,CHIP	27 5% 1/10W
				R57	1-216-011-00	RES,CHIP	27 5% 1/10W

Ref.No.	Part No.	Description	Remark		
R120	1-216-091-00	RES,CHIP	56K	5%	1/10W
R121	1-216-089-91	RES,CHIP	47K	5%	1/10W
R122	1-216-017-91	RES,CHIP	47	5%	1/10W
R123	1-216-047-91	RES,CHIP	820	5%	1/10W
R125	1-216-049-91	RES,CHIP	1K	5%	1/10W
R126	1-249-417-11	CARBON	1K	5%	1/4W F
R130	1-216-683-11	METAL CHIP	22K	0.50%	1/10W
R131	1-216-053-00	RES,CHIP	1.5K	5%	1/10W
R132	1-216-640-11	METAL CHIP	360	0.50%	1/10W
R133	1-216-049-91	RES,CHIP	1K	5%	1/10W
R134	1-216-643-11	METAL CHIP	470	0.50%	1/10W
R135	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R136	1-216-683-11	METAL CHIP	22K	0.50%	1/10W
R137	1-216-055-00	RES,CHIP	1.8K	5%	1/10W
R138	1-216-640-11	METAL CHIP	360	0.50%	1/10W
R139	1-216-049-91	RES,CHIP	1K	5%	1/10W
R140	1-216-643-11	METAL CHIP	470	0.50%	1/10W
R141	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R142	1-216-640-11	METAL CHIP	360	0.50%	1/10W
R143	1-216-043-91	RES,CHIP	560	5%	1/10W
R144	1-216-640-11	METAL CHIP	360	0.50%	1/10W
R145	1-216-654-11	METAL CHIP	1.3K	0.50%	1/10W
R148	1-216-683-11	METAL CHIP	22K	0.50%	1/10W
R149	1-216-683-11	METAL CHIP	22K	0.50%	1/10W
R150	1-216-067-00	RES,CHIP	5.6K	5%	1/10W
R151	1-216-017-91	RES,CHIP	47	5%	1/10W
R152	1-216-017-91	RES,CHIP	47	5%	1/10W
R153	1-216-039-00	RES,CHIP	390	5%	1/10W
 <CRYSTAL>					
X1	1-567-505-11 OSCILLATOR, CRYSTAL				

* A-1270-409-A QB BOARD, COMPLETE					

* 1-716-228-11 PWB, FB/FC/N/QB COMBINED					
* 7-322-065-72 RUBBER, RTV (SE-9168) (130G)					
 <CAPACITOR>					
C204	1-126-941-11	ELECT	470MF	20%	16V
C205	1-124-907-11	ELECT	10MF	20%	50V
C206	1-136-165-00	FILM	0.1MF	5%	50V
C207	1-124-907-11	ELECT	10MF	20%	50V
C301	1-124-907-11	ELECT	10MF	20%	50V
C302	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C318	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
 <CONNECTOR>					
CN102*1-566-043-11 PIN, CONNECTOR 4P					
CN103*1-566-062-11 PIN, CONNECTOR 10P					
CN104*1-566-043-11 PIN, CONNECTOR 4P					
CN105*1-566-042-11 PIN, CONNECTOR 3P					
CN106*1-566-042-11 PIN, CONNECTOR 3P					

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
		CN107*1-566-042-11 PIN, CONNECTOR 3P		R223	1-216-057-00	RES,CHIP 2.2K	5% 1/10W
		<DIODE>		R224	1-216-073-00	RES,CHIP 10K	5% 1/10W
D201	8-719-106-23	DIODE RD7.5M-B2		R225	1-216-025-91	RES,CHIP 100	5% 1/10W
D202	8-719-911-19	DIODE 1SS119-25		R226	1-216-065-91	RES,CHIP 4.7K	5% 1/10W
D203	8-719-801-78	DIODE 1SS184		R227	1-216-073-00	RES,CHIP 10K	5% 1/10W
D204	8-719-800-76	DIODE 1SS226		R228	1-216-049-91	RES,CHIP 1K	5% 1/10W
D301	8-719-801-78	DIODE 1SS184		R229	1-216-073-00	RES,CHIP 10K	5% 1/10W
				R231	1-216-448-11	METAL OXIDE 39	5% 2W F
D302	8-719-914-42	DIODE DA204K		R232	1-216-448-11	METAL OXIDE 39	5% 2W F
D303	8-719-914-42	DIODE DA204K					
D304	8-719-106-23	DIODE RD7.5M-B2		R233	1-216-631-11	METAL CHIP 150	0.50%1/10W
		<IC>		R234	1-216-631-11	METAL CHIP 150	0.50%1/10W
IC201	8-759-701-88	IC NJM7912FA		R235	1-216-631-11	METAL CHIP 150	0.50%1/10W
IC202	8-759-708-06	IC NJM78L06A		R236	1-216-631-11	METAL CHIP 150	0.50%1/10W
IC303	8-759-231-58	IC TA7812S		R301	1-216-037-00	RES,CHIP 330	5% 1/10W
		<JACK>					
J101	1-537-751-21	TERMINAL BOARD ASSY, I/O					
J102	1-566-848-21	CONNECTOR, S TERMINAL 4P					
		<TRANSISTOR>					
Q202	1-801-806-11	TRANSISTOR DTC144EK-T146					
Q203	1-801-806-11	TRANSISTOR DTC144EK-T146					
Q204	8-729-216-22	TRANSISTOR 2SA1162-G					
Q205	8-729-230-49	TRANSISTOR 2SC2712-YG					
Q206	1-801-806-11	TRANSISTOR DTC144EK-T146					
Q207	8-729-216-22	TRANSISTOR 2SA1162-G					
Q208	1-801-806-11	TRANSISTOR DTC144EK-T146					
Q209	1-801-806-11	TRANSISTOR DTC144EK-T146					
Q210	8-729-230-49	TRANSISTOR 2SC2712-YG					
Q211	8-729-216-22	TRANSISTOR 2SA1162-G					
Q212	1-801-806-11	TRANSISTOR DTC144EK-T146					
Q213	1-801-806-11	TRANSISTOR DTC144EK-T146					
Q214	8-729-230-49	TRANSISTOR 2SC2712-YG					
		<RESISTOR>					
R206	1-216-085-00	RES,CHIP 33K	5% 1/10W				
R207	1-216-073-00	RES,CHIP 10K	5% 1/10W				
R208	1-216-085-00	RES,CHIP 33K	5% 1/10W				
R209	1-216-073-00	RES,CHIP 10K	5% 1/10W				
R210	1-216-308-00	RES,CHIP 4.7	5% 1/10W				
R211	1-216-059-00	RES,CHIP 2.7K	5% 1/10W				
R212	1-216-085-00	RES,CHIP 33K	5% 1/10W				
R213	1-216-093-00	RES,CHIP 68K	5% 1/10W				
R214	1-216-013-00	RES,CHIP 33	5% 1/10W				
R216	1-216-081-00	RES,CHIP 22K	5% 1/10W				
R217	1-216-057-00	RES,CHIP 2.2K	5% 1/10W				
R218	1-216-037-00	RES,CHIP 330	5% 1/10W				
R219	1-216-025-91	RES,CHIP 100	5% 1/10W				
R220	1-216-017-91	RES,CHIP 47	5% 1/10W				
R221	1-216-049-91	RES,CHIP 1K	5% 1/10W				
R222	1-247-804-11	CARBON 75	5% 1/4W				

* A-1330-773-B CR BOARD, COMPLETE

1-556-880-81 LEAD ASSY, HIGH-VOLTAGE
 4-371-837-01 SPACER (TO-126), BN
 * 4-383-071-01 BRACKET, TRANSISTOR
 7-682-148-01 SCREW +P 3X8

<CAPACITOR>

C701	1-101-006-00	CERAMIC 0.047MF	50V
C702	1-136-165-00	FILM 0.1MF	5% 50V
C704	1-107-661-91	ELECT 10MF	20% 350V
C705	1-102-050-00	CERAMIC 0.01MF	500V
C706	1-162-115-00	CERAMIC 330PF	10% 2KV
C707	1-162-115-00	CERAMIC 330PF	10% 2KV
C708	1-137-368-11	FILM 0.0047MF	5% 50V
C709	1-101-006-00	CERAMIC 0.047MF	50V

<CONNECTOR>

CR1	* 1-508-784-00	PIN, CONNECTOR (5mm PITCH) 1P
CR2	* 1-508-786-00	PIN, CONNECTOR (5mm PITCH) 2P
CR3	* 1-566-058-11	PIN, CONNECTOR 6P
CR4	* 1-566-057-11	PIN, CONNECTOR 5P
CR5	* 1-566-054-11	PIN, CONNECTOR 2P

<DIODE>

D701	8-719-911-19	DIODE 1SS119-25
D702	8-719-911-19	DIODE 1SS119-25
D703	8-719-911-19	DIODE 1SS119-25
D704	8-719-911-19	DIODE 1SS119-25
D705	8-719-911-19	DIODE 1SS119-25
D706	8-719-911-19	DIODE 1SS119-25
D707	8-719-110-36	DIODE RD13ESB2

<JACK>

J701	1-251-509-11	SOCKET, PICTURE TUBE
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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
<COIL>				<CONNECTOR>			
L701	1-408-159-00	INDUCTOR 3.3UH		CG1	* 1-508-784-00	PIN, CONNECTOR (5mm PITCH) 1P	
L702	1-408-159-00	INDUCTOR 3.3UH		CG2	* 1-508-786-00	PIN, CONNECTOR (5mm PITCH) 2P	
L703	1-408-607-31	INDUCTOR 22UH		CG3	* 1-566-058-11	PIN, CONNECTOR 6P	
L704	1-408-607-31	INDUCTOR 22UH		CG4	* 1-566-057-11	PIN, CONNECTOR 5P	
<NEON LAMP>				<DIODE>			
NL701	1-519-108-99	LAMP, NEON		D721	8-719-911-19	DIODE 1SS119-25	
<TRANSISTOR>				D722	8-719-911-19	DIODE 1SS119-25	
Q701	8-729-821-02	TRANSISTOR 2SC3503-DE		D723	8-719-911-19	DIODE 1SS119-25	
Q702	8-729-821-02	TRANSISTOR 2SC3503-DE		D724	8-719-911-19	DIODE 1SS119-25	
Q703	8-729-801-88	TRANSISTOR 2SA1381-E		D725	8-719-911-19	DIODE 1SS119-25	
Q704	8-729-801-88	TRANSISTOR 2SA1381-E		D726	8-719-911-19	DIODE 1SS119-25	
<RESISTOR>				D727	8-719-110-36	DIODE RD13ESB2	
R701	1-249-405-11	CARBON 100	5% 1/4W F	<JACK>			
R703	1-249-405-11	CARBON 100	5% 1/4W F	J702	△ 1-251-509-11	SOCKET, PICTURE TUBE	
R704	1-215-928-11	METAL OXIDE 68K	5% 3W F	<COIL>			
R705	1-215-431-00	METAL 2.7K	1% 1/4W	L721	1-408-159-00	INDUCTOR 3.3UH	
R706	1-216-510-11	METAL OXIDE 8.2K	5% 5W F	L722	1-408-159-00	INDUCTOR 3.3UH	
R707	1-249-405-11	CARBON 100	5% 1/4W F	L723	1-408-607-31	INDUCTOR 22UH	
R708	1-202-561-00	SOLID 330	10% 1/2W	L724	1-408-607-31	INDUCTOR 22UH	
R709	1-202-828-11	SOLID 6.8K	10% 1/2W	<NEON LAMP>			
R710	1-202-721-00	SOLID 1.5M	10% 1/2W	NL721	1-519-108-99	LAMP, NEON	
R711	1-202-847-00	SOLID 560K	10% 1/2W	<TRANSISTOR>			
R712	1-202-814-11	SOLID 33K	10% 1/2W	Q721	8-729-821-02	TRANSISTOR 2SC3503-DE	
R713	1-249-421-11	CARBON 2.2K	5% 1/4W F	Q722	8-729-821-02	TRANSISTOR 2SC3503-DE	
R714	1-202-818-00	SOLID 1K	10% 1/2W	Q723	8-729-801-88	TRANSISTOR 2SA1381-E	
<SPARK GAP>				Q724	8-729-801-88	TRANSISTOR 2SA1381-E	
SG701	1-519-063-XX	DISCHARGING GAP		<RESISTOR>			
*****				R721	1-249-405-11	CARBON 100	5% 1/4W F
* A-1330-774-B CG BOARD, COMPLETE				R723	1-249-405-11	CARBON 100	5% 1/4W F
*****				R724	1-215-928-11	METAL OXIDE 68K	5% 3W F
1-556-880-81 LEAD ASSY, HIGH-VOLTAGE				R725	1-215-431-00	METAL 2.7K	1% 1/4W
4-371-837-01 SPACER (TO-126), BN				R726	1-216-510-11	METAL OXIDE 8.2K	5% 5W F
* 4-383-071-01 BRACKET, TRANSISTOR				R727	1-249-405-11	CARBON 100	5% 1/4W F
7-682-148-01 SCREW +P 3X8				R728	1-202-561-00	SOLID 330	10% 1/2W
<CAPACITOR>				R729	1-202-828-11	SOLID 6.8K	10% 1/2W
C721	1-101-006-00	CERAMIC 0.047MF	50V	R730	1-202-721-00	SOLID 1.5M	10% 1/2W
C722	1-136-165-00	FILM 0.1MF	5% 50V	R731	1-202-847-00	SOLID 560K	10% 1/2W
C724	△ 1-107-661-91	ELECT 10MF	20% 350V	R732	1-202-814-11	SOLID 33K	10% 1/2W
C725	1-102-050-00	CERAMIC 0.01MF	500V	R733	1-249-421-11	CARBON 2.2K	5% 1/4W F
C726	1-162-115-00	CERAMIC 330PF	10% 2KV	R734	1-202-818-00	SOLID 1K	10% 1/2W
C727	1-162-115-00	CERAMIC 330PF	10% 2KV				
C728	1-137-368-11	FILM 0.0047MF	5% 50V				
C729	1-101-006-00	CERAMIC 0.047MF	50V				

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
<SPARK GAP>				<TRANSISTOR>			
SG721	1-519-063-XX	DISCHARGING GAP		Q741	8-729-821-02	TRANSISTOR 2SC3503-DE	
				Q742	8-729-821-02	TRANSISTOR 2SC3503-DE	
				Q743	8-729-801-88	TRANSISTOR 2SA1381-E	
				Q744	8-729-801-88	TRANSISTOR 2SA1381-E	
*****				<RESISTOR>			
* A-1330-775-B CB BOARD, COMPLETE				R741	1-249-405-11	CARBON 100 5% 1/4W F	
*****				R743	1-249-405-11	CARBON 100 5% 1/4W F	
1-556-880-81 LEAD ASSY, HIGH-VOLTAGE				R744	1-215-928-11	METAL OXIDE 68K 5% 3W F	
4-371-837-01 SPACER (TO-126), BN				R745	1-215-431-00	METAL 2.7K 1% 1/4W	
* 4-383-071-01 BRACKET, TRANSISTOR				R746	1-216-510-11	METAL OXIDE 8.2K 5% 5W F	
7-682-148-01 SCREW +P 3X8				R747	1-249-405-11	CARBON 100 5% 1/4W F	
<CAPACITOR>				R748	1-202-561-00	SOLID 330 10% 1/2W	
C741	1-101-006-00	CERAMIC 0.047MF 50V		R749	1-202-828-11	SOLID 6.8K 10% 1/2W	
C742	1-136-165-00	FILM 0.1MF 5% 50V		R750	1-202-721-00	SOLID 1.5M 10% 1/2W	
C744	1-107-661-91	ELECT 10MF 20% 350V		R751	1-202-847-00	SOLID 560K 10% 1/2W	
C745	1-102-050-00	CERAMIC 0.01MF 500V		R752	1-202-814-11	SOLID 33K 10% 1/2W	
C746	1-162-115-00	CERAMIC 330PF 10% 2KV		R753	1-249-421-11	CARBON 2.2K 5% 1/4W F	
C747	1-162-115-00	CERAMIC 330PF 10% 2KV		R754	1-202-818-00	SOLID 1K 10% 1/2W	
C748	1-137-368-11	FILM 0.0047MF 5% 50V		<SPARK GAP>			
C749	1-101-006-00	CERAMIC 0.047MF 50V		SG741	1-519-063-XX	DISCHARGING GAP	
<CONNECTOR>				*****			
CB1	* 1-508-784-00	PIN, CONNECTOR (5mm PITCH) 1P		* A-1340-922-C E BOARD, COMPLETE			
CB2	* 1-508-786-00	PIN, CONNECTOR (5mm PITCH) 2P		*****			
CB3	* 1-566-058-11	PIN, CONNECTOR 6P		(INCLUDING EB, EC BOARDS)			
CB4	* 1-566-057-11	PIN, CONNECTOR 5P		4-383-022-01	SPACER, MICA		
CB5	* 1-566-054-11	PIN, CONNECTOR 2P		7-682-950-01	SCREW +PSW 3X12		
<DIODE>				<CAPACITOR>			
D741	8-719-911-19	DIODE 1SS119-25		C1	1-107-636-11	ELECT 10MF 20% 160V	
D742	8-719-911-19	DIODE 1SS119-25		C2	1-128-577-11	ELECT 0.47MF 20% 100V	
D743	8-719-911-19	DIODE 1SS119-25		C3	1-102-106-00	CERAMIC 100PF 10% 50V	
D744	8-719-911-19	DIODE 1SS119-25		C4	1-102-030-00	CERAMIC 330PF 10% 500V	
D745	8-719-911-19	DIODE 1SS119-25		C5	1-107-368-11	FILM 0.047MF 10% 200V	
D746	8-719-911-19	DIODE 1SS119-25		C6	1-102-030-00	CERAMIC 330PF 10% 500V	
D747	8-719-110-36	DIODE RD13ESB2		C7	1-107-368-11	FILM 0.047MF 10% 200V	
<JACK>				C8	1-123-024-21	ELECT 33MF 160V	
J703	1-251-509-11	SOCKET, PICTURE TUBE		C9	1-136-113-00	FILM 2MF 5% 200V	
<COIL>				C10	1-136-113-00	FILM 2MF 5% 200V	
L741	1-408-159-00	INDUCTOR 3.3UH		C11	1-130-706-00	FILM 0.008MF 3% 1.6KV	
L742	1-408-159-00	INDUCTOR 3.3UH		C12	1-109-890-11	ELECT 220MF 20% 63V	
L743	1-408-607-31	INDUCTOR 22UH		C13	1-109-890-11	ELECT 220MF 20% 63V	
L744	1-408-607-31	INDUCTOR 22UH		C14	1-109-890-11	ELECT 220MF 20% 63V	
<NEON LAMP>				C15	1-101-004-00	CERAMIC 0.01MF 50V	
NL741	1-519-108-99	LAMP, NEON		C16	1-128-578-11	ELECT 1MF 20% 100V	
				C17	1-126-964-11	ELECT 10MF 20% 50V	
				C18	1-104-664-11	ELECT 47MF 20% 25V	
				C19	1-107-364-11	FILM 0.01MF 10% 200V	
				C20	1-136-153-00	FILM 0.01MF 5% 50V	



Ref.No.	Part No.	Description	Remark			Ref.No.	Part No.	Description	Remark		
C21	1-136-153-00	FILM	0.01MF	5%	50V	Q4	8-729-119-80	TRANSISTOR 2SC2688-LK			
C24	1-101-006-00	CERAMIC	0.047MF		50V	Q5	8-729-802-71	TRANSISTOR 2SA1407-D			
C25	1-104-665-11	ELECT	100MF	20%	25V	Q6	8-729-119-78	TRANSISTOR 2SC2785-HFE			
C26	1-104-665-11	ELECT	100MF	20%	25V	Q7	8-729-030-10	TRANSISTOR DTC144WSA			
C27	1-101-006-00	CERAMIC	0.047MF		50V	Q9	8-729-119-76	TRANSISTOR 2SA1175-HFE			
C28	1-101-006-00	CERAMIC	0.047MF		50V	<RESISTOR>					
C29	1-126-964-11	ELECT	10MF	20%	50V	R1	1-249-417-11	CARBON	1K	5%	1/4W
C30	1-126-964-11	ELECT	10MF	20%	50V	R2	1-217-206-11	WIREWOUND	3.3	10%	2W F
C31	1-101-006-00	CERAMIC	0.047MF		50V	R3	1-249-417-11	CARBON	1K	5%	1/4W F
C32	1-126-964-11	ELECT	10MF	20%	50V	R4	1-249-469-11	CARBON	100K	5%	1/4W
C33	1-104-665-11	ELECT	100MF	20%	25V	R5	1-247-843-11	CARBON	3.3K	5%	1/4W
C34	1-107-370-11	FILM	0.1MF	10%	200V	R6	1-249-429-11	CARBON	10K	5%	1/4W F
C35	1-102-125-00	CERAMIC	0.0047MF	10%	50V	R7	1-215-921-11	METAL OXIDE	4.7K	5%	3W F
<DIODE>						R8	1-249-429-11	CARBON	10K	5%	1/4W F
D1	8-719-300-80	DIODE RU-1C				R9	1-215-924-00	METAL OXIDE	15K	5%	3W F
D2	8-719-300-80	DIODE RU-1C				R10	1-215-880-00	METAL OXIDE	10	5%	2W F
D3	8-719-971-20	DIODE ERC38-06				R12	1-216-379-11	METAL OXIDE	6.8	5%	2W F
D4	8-719-971-20	DIODE ERC38-06				R13	1-215-868-00	METAL OXIDE	680	5%	1W F
D6	8-719-109-98	DIODE RD6.8ESB3				R14	1-247-716-11	CARBON	1.8K	5%	1/4W F
D7	8-719-110-09	DIODE RD8.2ESB3				R15	1-247-716-11	CARBON	1.8K	5%	1/4W F
D8	8-719-911-19	DIODE 1SS119-25				R16	1-247-716-11	CARBON	1.8K	5%	1/4W F
D9	8-719-109-98	DIODE RD6.8ESB3				R17	1-249-385-11	CARBON	2.2	5%	1/4W F
D10	8-719-911-19	DIODE 1SS119-25				R18	1-249-385-11	CARBON	2.2	5%	1/4W F
<CONNECTOR>						R19	1-249-385-11	CARBON	2.2	5%	1/4W F
E1	*1-506-371-00	PIN, CONNECTOR 2P				R20	1-247-807-31	CARBON	100	5%	1/4W
E2	*1-506-371-00	PIN, CONNECTOR 2P				R21	1-247-843-11	CARBON	3.3K	5%	1/4W
E3	*1-506-371-00	PIN, CONNECTOR 2P				R22	1-249-440-11	CARBON	82K	5%	1/4W
E4	*1-508-786-00	PIN, CONNECTOR (5mm PITCH) 2P				R25	1-215-469-00	METAL	100K	1%	1/4W
E5	*1-566-060-11	PIN, CONNECTOR 8P				R26	1-215-443-00	METAL	8.2K	1%	1/4W
E6	*1-566-055-11	PIN, CONNECTOR 3P				R27	1-215-455-00	METAL	27K	1%	1/4W
E7	*1-566-062-11	PIN, CONNECTOR 10P				R28	1-215-475-00	METAL	180K	1%	1/4W
E8	*1-566-060-11	PIN, CONNECTOR 8P				R29	1-215-475-00	METAL	180K	1%	1/4W
E9	*1-566-055-11	PIN, CONNECTOR 3P				R30	1-215-455-00	METAL	27K	1%	1/4W
E11	*1-566-055-11	PIN, CONNECTOR 3P				R31	1-247-893-11	CARBON	390K	5%	1/4W
<IC>						R32	1-249-417-11	CARBON	1K	5%	1/4W
IC1	8-759-708-12	IC NJM78L12A				R33	1-247-895-91	CARBON	470K	5%	1/4W
IC2	8-759-145-58	IC uPC4558C				R34	1-215-485-00	METAL	470K	1%	1/4W
IC3	8-759-155-16	IC uPC79M12HF				R41	1-215-863-11	METAL OXIDE	100	5%	1W F
<COIL>						R42	1-249-435-11	CARBON	33K	5%	1/4W
L1	1-459-155-00	COIL (WITH CORE) 45UH				R43	1-215-477-00	METAL	220K	1%	1/4W
L2	1-459-155-00	COIL (WITH CORE) 45UH				R44	1-249-413-11	CARBON	470	5%	1/4W
L5	1-459-241-12	COIL, HORIZONTAL LINIALITY				R45	1-247-725-11	CARBON	10K	5%	1/4W
L6	1-459-348-00	COIL, VAR, FERRITE (HWC)				R46	1-249-421-11	CARBON	2.2K	5%	1/4W
L7	1-459-348-00	COIL, VAR, FERRITE (HWC)				R47	1-249-429-11	CARBON	10K	5%	1/4W
L8	1-459-348-00	COIL, VAR, FERRITE (HWC)				R48	1-215-419-00	METAL	820	1%	1/4W
<TRANSISTOR>						<TRANSFORMER>					
Q1	8-729-800-80	TRANSISTOR 2SD1399-CA				T1	1-437-078-00	TRANSFORMER, HORIZONTAL DRIVE			
Q2	8-729-045-97	TRANSISTOR 2SC4161CB				T2	1-437-078-00	TRANSFORMER, HORIZONTAL DRIVE			
Q3	8-729-119-80	TRANSISTOR 2SC2688-LK				T3	1-439-320-00	TRANSFORMER, FERRITE (HOT)			

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
	* 1-621-055-11	EB BOARD	*****			<IC>	
	* 7-322-065-72	RUBBER, RTV (SE-9168) (130G)		IC1	8-759-145-58	IC uPC4558C	
		<CAPACITOR>				<TRANSISTOR>	
C1	1-126-963-11	ELECT	4.7MF 20% 50V	Q1	8-729-205-96	TRANSISTOR 2SC3668-O	
C2	1-126-963-11	ELECT	4.7MF 20% 50V	Q2	8-729-205-94	TRANSISTOR 2SA1428-O	
C3	1-136-159-00	FILM	0.033MF 5% 50V			<RESISTOR>	
C5	1-102-106-00	CERAMIC	100PF 10% 50V	R1	1-215-423-00	METAL 1.2K 1% 1/4W	
C6	1-137-366-11	FILM	0.0022MF 5% 50V	R2	1-249-417-11	CARBON 1K 5% 1/4W	
C7	1-126-964-11	ELECT	10MF 20% 50V	R3	1-215-445-00	METAL 10K 1% 1/4W	
C8	1-136-165-00	FILM	0.1MF 5% 50V	R4	1-215-445-00	METAL 10K 1% 1/4W	
		<DIODE>		R5	1-215-445-00	METAL 10K 1% 1/4W	
D1	8-719-911-19	DIODE 1SS119-25		R6	1-215-445-00	METAL 10K 1% 1/4W	
		<IC>		R7	1-215-375-00	METAL 12 1% 1/4W	
IC1	8-759-100-75	IC uPC1394C		R8	1-215-375-00	METAL 12 1% 1/4W	
		<RESISTOR>		R9	1-215-375-00	METAL 12 1% 1/4W	
R1	1-215-441-00	METAL 6.8K 1% 1/4W				<CONNECTOR>	
R2	1-249-417-11	CARBON 1K 5% 1/4W		W3	* 1-506-603-11	PLUG, L TYPE (2.0MM PITCH) 10P	
R3	1-249-431-11	CARBON 15K 5% 1/4W				*****	
R4	1-249-427-11	CARBON 6.8K 5% 1/4W				* A-1340-979-A	ED BOARD, COMPLETE
R5	1-249-441-11	CARBON 100K 5% 1/4W				*****	
R6	1-247-843-11	CARBON 3.3K 5% 1/4W				<CONNECTOR>	
R7	1-249-429-11	CARBON 10K 5% 1/4W		ED1	* 1-566-055-11	PIN, CONNECTOR 3P	
R8	1-249-413-11	CARBON 470 5% 1/4W				<COIL>	
R9	1-249-428-11	CARBON 8.2K 5% 1/4W		L1	1-459-109-00	COIL,DUST CORE	
R10	1-249-437-11	CARBON 47K 5% 1/4W		L2	1-459-109-00	COIL,DUST CORE	
R11	1-247-895-91	CARBON 470K 5% 1/4W				<RESISTOR>	
R12	1-249-435-11	CARBON 33K 5% 1/4W		R1	1-215-902-11	METAL OXIDE 47K 5% 1W F	
R13	1-215-441-00	METAL 6.8K 1% 1/4W				*****	
R14	1-215-441-00	METAL 6.8K 1% 1/4W				* A-1341-784-A	DY1 BOARD, COMPLETE
		<CONNECTOR>				*****	
W1	* 1-506-602-11	PLUG, L TYPE (2.0MM PITCH) 5P				<CAPACITOR>	
W2	* 1-506-602-11	PLUG, L TYPE (2.0MM PITCH) 5P		C701	1-162-115-00	CERAMIC 330PF 10% 2KV	
		*****		C702	1-162-115-00	CERAMIC 330PF 10% 2KV	
		* 1-621-060-11	EC BOARD			<CONNECTOR>	
		*****		CN701	*1-566-041-11	PIN, CONNECTOR 2P	
		<CAPACITOR>		CN702	*1-566-041-11	PIN, CONNECTOR 2P	
C1	1-161-379-00	CERAMIC 0.01MF 30% 25V					
C2	1-162-290-31	CERAMIC 470PF 10% 50V					
C3	1-162-290-31	CERAMIC 470PF 10% 50V					

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
CN703*	1-566-042-11	PIN, CONNECTOR 3P		C26	1-137-374-11	FILM	0.047MF 5% 50V
CN704*	1-691-961-11	PIN, CONNECTOR (PC BOARD) 2P		C27	1-137-370-11	FILM	0.01MF 5% 50V
<RESISTOR>				C28	1-137-372-11	FILM	0.022MF 5% 50V
R701	1-202-822-00	SOLID	2.2K 20% 1/2W	C29	1-124-902-00	ELECT	0.47MF 20% 50V
R702	1-202-822-00	SOLID	2.2K 20% 1/2W	C30	1-137-194-81	FILM	0.47MF 5% 50V
<SPARK GAP>				C31	1-137-374-11	FILM	0.047MF 5% 50V
SG701	1-519-422-11	GAP, SPARK		C32	1-104-666-11	ELECT	220MF 20% 16V
SG702	1-519-422-11	GAP, SPARK		C33	1-130-471-00	FILM	0.001MF 5% 50V
*****				C34	1-101-004-00	CERAMIC	0.01MF 50V
* A-1341-785-A DY2 BOARD, COMPLETE				C36	1-137-370-11	FILM	0.01MF 5% 50V
*****				C37	1-107-715-11	ELECT	22MF 20% 35V
<CONNECTOR>				C38	1-104-663-11	ELECT	33MF 20% 16V
CN5	* 1-566-043-11	PIN, CONNECTOR 4P		C39	1-130-495-00	FILM	0.1MF 5% 50V
*****				C40	1-128-557-11	ELECT	0.1MF 20% 100V
* A-1341-786-A D BOARD, COMPLETE				C41	1-101-361-00	CERAMIC	150PF 5% 50V
*****				C43	1-128-557-11	ELECT	0.1MF 20% 100V
(INCLUDING DA, DB BOARDS)				C44	1-124-907-11	ELECT	10MF 20% 50V
* 1-535-615-11 TERMINAL (LAMP SOCKET)				C45	1-102-824-00	CERAMIC	470PF 5% 50V
* 4-378-621-01 RETAINER, TR				C46	1-102-030-00	CERAMIC	330PF 10% 500V
7-682-648-09 SCREW +PS 3X8				C47	1-137-370-11	FILM	0.01MF 5% 50V
7-685-646-79 SCREW +BVTP 3X8 TYPE2 IT-3				C48	1-101-004-00	CERAMIC	0.01MF 50V
<CAPACITOR>				C49	1-101-004-00	CERAMIC	0.01MF 50V
C1	1-101-004-00	CERAMIC	0.01MF 50V	C50	1-126-963-11	ELECT	4.7MF 20% 50V
C2	1-124-478-11	ELECT	100MF 20% 25V	C51	1-104-665-11	ELECT	100MF 20% 10V
C3	1-124-478-11	ELECT	100MF 20% 25V	C52	1-104-665-11	ELECT	100MF 20% 10V
C4	1-104-665-11	ELECT	100MF 20% 16V	C53	1-126-964-11	ELECT	10MF 20% 50V
C5	1-104-665-11	ELECT	100MF 20% 16V	C54	1-101-004-00	CERAMIC	0.01MF 50V
C6	1-102-947-00	CERAMIC	10PF 0.5PF 50V	C55	1-104-664-11	ELECT	47MF 20% 16V
C7	1-126-961-11	ELECT	2.2MF 20% 50V	C56	1-104-664-11	ELECT	47MF 20% 16V
C8	1-101-361-00	CERAMIC	150PF 5% 50V	C57	1-101-004-00	CERAMIC	0.01MF 50V
C9	1-137-370-11	FILM	0.01MF 5% 50V	C58	1-104-665-11	ELECT	100MF 20% 10V
C10	1-130-495-00	FILM	0.1MF 5% 50V	C59	1-104-665-11	ELECT	100MF 20% 10V
C12	1-126-961-11	ELECT	2.2MF 20% 50V	C60	1-126-964-11	ELECT	10MF 20% 50V
C13	1-137-372-11	FILM	0.022MF 5% 50V	C61	1-126-964-11	ELECT	10MF 20% 50V
C14	1-124-907-11	ELECT	10MF 20% 50V	C62	1-126-964-11	ELECT	10MF 20% 50V
C15	1-126-941-11	ELECT	470MF 20% 16V	C63	1-104-664-11	ELECT	47MF 20% 16V
C16	1-101-006-00	CERAMIC	0.047MF 50V	C64	1-104-664-11	ELECT	47MF 20% 16V
C17	1-124-903-11	ELECT	1MF 20% 50V	C65	1-101-004-00	CERAMIC	0.01MF 50V
C18	1-137-370-11	FILM	0.01MF 5% 50V	C66	1-101-004-00	CERAMIC	0.01MF 50V
C19	1-130-480-00	FILM	0.0056MF 5% 50V	C67	1-104-666-11	ELECT	220MF 20% 16V
C20	1-124-903-11	ELECT	1MF 20% 50V	C68	1-104-666-11	ELECT	220MF 20% 16V
C21	1-126-963-11	ELECT	4.7MF 20% 50V	C69	1-104-665-11	ELECT	100MF 20% 16V
C22	1-124-907-11	ELECT	10MF 20% 50V	C70	1-104-665-11	ELECT	100MF 20% 16V
C23	1-126-941-11	ELECT	470MF 20% 16V	C72	1-136-161-00	FILM	0.047MF 5% 50V
C25	1-124-903-11	ELECT	1MF 20% 50V	C73	1-101-004-00	CERAMIC	0.0

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
C87	1-107-364-11	MYLAR	0.01MF 10% 200V	D23	8-719-110-41	DIODE RD15ESB2	
C88	1-126-961-11	ELECT	2.2MF 20% 50V	D24	8-719-110-41	DIODE RD15ESB2	
C89	1-107-714-11	ELECT	10MF 20% 16V	D29	8-719-109-85	DIODE RD5.1ESB2	
C90	1-104-665-11	ELECT	100MF 20% 16V				
C91	1-126-965-11	ELECT	22MF 20% 50V		<IC>		
C92	1-107-715-11	ELECT	22MF 20% 35V	IC1	8-759-100-60	IC uPC1377C	
C93	1-126-965-11	ELECT	22MF 20% 50V	IC2	8-749-911-21	IC BX-1121	
C94	1-124-907-11	ELECT	10MF 20% 50V	IC3	8-759-140-53	IC uPC4053BC	
C95	1-124-907-11	ELECT	10MF 20% 50V	IC4	8-759-231-58	IC TA7812S	
C96	1-124-907-11	ELECT	10MF 20% 50V	IC5	8-759-701-88	IC NJM7912FA	
C97	1-124-907-11	ELECT	10MF 20% 50V	IC6	8-759-708-12	IC NJM78L12A	
C98	1-126-965-11	ELECT	22MF 20% 50V	IC7	8-759-708-12	IC NJM78L12A	
C99	1-126-965-11	ELECT	22MF 20% 50V	IC8	8-759-634-50	IC M5218AL	
C100	1-104-663-11	ELECT	33MF 20% 16V	IC9	8-741-112-20	IC BX-1122	
		<CONNECTOR>		IC10	8-759-000-48	IC MC14052BCP	
CN401	*1-566-056-11	PIN, CONNECTOR 4P		IC11	8-759-634-50	IC M5218AL	
CN402	*1-566-054-31	PIN, CONNECTOR 2P		IC12	8-759-634-50	IC M5218AL	
CN403	*1-566-056-11	PIN, CONNECTOR 4P		IC13	8-759-634-50	IC M5218AL	
CN404	*1-566-054-11	PIN, CONNECTOR 2P		IC14	8-759-111-69	IC uPC1037HA	
CN405	*1-566-059-11	PIN, CONNECTOR 7P		IC15	8-759-111-69	IC uPC1037HA	
CN406	*1-566-060-11	PIN, CONNECTOR 8P		IC16	8-759-982-07	IC RC7808FA	
CN407	*1-566-060-11	PIN, CONNECTOR 8P		IC17	8-759-990-36	IC RC7908FA	
CN408	*1-566-057-11	PIN, CONNECTOR 5P		IC18	8-759-145-58	IC uPC4558C	
CN410	*1-566-059-11	PIN, CONNECTOR 7P		IC19	8-759-145-58	IC uPC4558C	
CN411	*1-566-056-11	PIN, CONNECTOR 4P		IC20	8-759-700-69	IC NJM79L12A	
CN412	*1-566-056-11	PIN, CONNECTOR 4P		IC21	8-759-145-58	IC uPC4558C	
CN413	*1-566-056-11	PIN, CONNECTOR 4P		IC22	8-759-145-58	IC uPC4558C	
CN414	*1-566-055-11	PIN, CONNECTOR 3P		IC23	8-759-145-58	IC uPC4558C	
CN415	*1-566-055-11	PIN, CONNECTOR 3P					
CN416	*1-566-055-11	PIN, CONNECTOR 3P			<PILOT LAMP>		
CN417	*1-566-055-11	PIN, CONNECTOR 3P		PL1	1-518-590-11	LAMP, PILOT (WITH HOLDER)	
CN418	*1-566-055-11	PIN, CONNECTOR 3P		PL2	1-518-590-11	LAMP, PILOT (WITH HOLDER)	
CN419	*1-566-055-11	PIN, CONNECTOR 3P					
CN422	*1-566-062-11	PIN, CONNECTOR 10P			<TRANSISTOR>		
CN423	*1-566-056-11	PIN, CONNECTOR 4P		Q1	8-729-119-78	TRANSISTOR 2SC2785-HFE	
		<DIODE>		Q2	8-729-119-78	TRANSISTOR 2SC2785-HFE	
D1	8-719-911-19	DIODE 1SS119-25		Q3	8-729-119-78	TRANSISTOR 2SC2785-HFE	
D2	8-719-911-19	DIODE 1SS119-25		Q4	8-729-119-78	TRANSISTOR 2SC2785-HFE	
D3	8-719-911-19	DIODE 1SS119-25		Q5	8-729-119-78	TRANSISTOR 2SC2785-HFE	
D4	8-719-911-19	DIODE 1SS119-25		Q6	8-729-119-78	TRANSISTOR 2SC2785-HFE	
D6	8-719-911-19	DIODE 1SS119-25		Q7	8-729-238-32	TRANSISTOR 2SC2383-O	
D7	8-719-911-19	DIODE 1SS119-25		Q8	8-729-045-96	TRANSISTOR 2SD2202	
D8	8-719-911-19	DIODE 1SS119-25		Q9	8-729-045-95	TRANSISTOR 2SB1454	
D9	8-719-911-19	DIODE 1SS119-25		Q10	8-729-238-32	TRANSISTOR 2SC2383-O	
D10	8-719-911-19	DIODE 1SS119-25		Q11	8-729-045-96	TRANSISTOR 2SD2202	
D11	8-719-911-19	DIODE 1SS119-25		Q12	8-729-045-95	TRANSISTOR 2SB1454	
D12	8-719-911-19	DIODE 1SS119-25		Q13	8-729-238-32	TRANSISTOR 2SC2383-O	
D13	8-719-110-36	DIODE RD13ESB2		Q14	8-729-045-96	TRANSISTOR 2SD2202	
D14	8-719-911-19	DIODE 1SS119-25		Q15	8-729-045-95	TRANSISTOR 2SB1454	
D15	8-719-911-19	DIODE 1SS119-25		Q16	8-729-119-78	TRANSISTOR 2SC2785-HFE	
D16	8-719-911-19	DIODE 1SS119-25		Q17	8-729-119-78	TRANSISTOR 2SC2785-HFE	
D17	8-719-911-19	DIODE 1SS119-25		Q18	8-729-119-78	TRANSISTOR 2SC2785-HFE	
D18	8-719-911-19	DIODE 1SS119-25		Q19	8-729-119-78	TRANSISTOR 2SC2785-HFE	
D19	8-719-911-19	DIODE 1SS119-25		Q20	8-729-119-76	TRANSISTOR 2SA1175-HFE	
D20	8-719-109-85	DIODE RD5.1ESB2		Q21	8-729-030-02	TRANSISTOR DTC144ESA	
D21	8-719-109-85	DIODE RD5.1ESB2		Q22	8-729-030-02	TRANSISTOR DTC144ESA	



Ref.No.	Part No.	Description	Remark			Ref.No.	Part No.	Description	Remark		
Q23	8-729-105-73	TRANSISTOR 2SK523-L2				R49	1-249-417-11	CARBON 1K	5%	1/4W	
Q24	8-729-119-78	TRANSISTOR 2SC2785-HFE				R50	1-249-428-11	CARBON 8.2K	5%	1/4W	
Q25	8-729-030-02	TRANSISTOR DTC144ESA									
Q26	8-729-105-73	TRANSISTOR 2SK523-L2				R51	1-247-807-31	CARBON 100	5%	1/4W	
Q27	8-729-119-78	TRANSISTOR 2SC2785-HFE				R52	1-249-408-11	CARBON 180	5%	1/4W	
Q28	8-729-030-02	TRANSISTOR DTC144ESA				R53	1-249-427-11	CARBON 6.8K	5%	1/4W	
Q30	8-729-119-78	TRANSISTOR 2SC2785-HFE				R54	1-215-415-00	METAL 560	1%	1/4W	
Q31	8-729-030-02	TRANSISTOR DTC144ESA				R55	1-215-415-00	METAL 560	1%	1/4W	
<RESISTOR>						R56	1-247-807-31	CARBON 100	5%	1/4W	
R1	1-215-457-00	METAL 33K	1%	1/4W		R57	1-215-413-00	METAL 470	1%	1/4W	
R2	1-215-467-00	METAL 82K	1%	1/4W		R58	1-249-429-11	CARBON 10K	5%	1/4W	
R3	1-247-881-00	CARBON 120K	5%	1/4W		R59	1-214-971-11	METAL 2M	1%	1/4W	
R4	1-249-417-11	CARBON 1K	5%	1/4W		R60	1-215-467-00	METAL 82K	1%	1/4W	
R5	1-247-843-11	CARBON 3.3K	5%	1/4W							
R6	1-249-434-11	CARBON 27K	5%	1/4W		R62	1-215-439-00	METAL 5.6K	1%	1/4W	
R7	1-249-425-11	CARBON 4.7K	5%	1/4W		R63	1-215-431-00	METAL 2.7K	1%	1/4W	
R8	1-249-421-11	CARBON 2.2K	5%	1/4W		R64	1-249-417-11	CARBON 1K	5%	1/4W	
R9	1-215-447-00	METAL 12K	1%	1/4W		R65	1-249-429-11	CARBON 10K	5%	1/4W	
R10	1-249-417-11	CARBON 1K	5%	1/4W		R66	1-249-417-11	CARBON 1K	5%	1/4W	
R11	1-215-445-00	METAL 10K	1%	1/4W		R67	1-249-429-11	CARBON 10K	5%	1/4W	
R12	1-215-455-00	METAL 27K	1%	1/4W		R68	1-249-429-11	CARBON 10K	5%	1/4W	
R13	1-249-417-11	CARBON 1K	5%	1/4W		R69	1-215-457-00	METAL 33K	1%	1/4W	
R14	1-249-441-11	CARBON 100K	5%	1/4W		R70	1-215-421-00	METAL 1K	1%	1/4W	
R15	1-215-447-00	METAL 12K	1%	1/4W		R71	1-249-429-11	CARBON 10K	5%	1/4W	
R16	1-247-903-00	CARBON 1M	5%	1/4W		R72	1-249-429-11	CARBON 10K	5%	1/4W	
R17	1-247-903-00	CARBON 1M	5%	1/4W		R73	1-249-429-11	CARBON 10K	5%	1/4W	
R18	1-249-441-11	CARBON 100K	5%	1/4W		R74	1-249-411-11	CARBON 330	5%	1/4W	
R19	1-247-807-31	CARBON 100	5%	1/4W		R75	1-249-411-11	CARBON 330	5%	1/4W	
R20	1-249-417-11	CARBON 1K	5%	1/4W		R76	1-249-429-11	CARBON 10K	5%	1/4W	
R21	1-247-895-91	CARBON 470K	5%	1/4W		R77	1-215-471-00	METAL 120K	1%	1/4W	
R22	1-249-417-11	CARBON 1K	5%	1/4W		R78	1-215-443-00	METAL 8.2K	1%	1/4W	
R23	1-215-467-00	METAL 82K	1%	1/4W		R79	1-215-429-00	METAL 2.2K	1%	1/4W	
R24	1-215-467-00	METAL 82K	1%	1/4W		R80	1-215-437-00	METAL 4.7K	1%	1/4W	
R25	1-249-424-11	CARBON 3.9K	5%	1/4W		R81	1-215-443-00	METAL 8.2K	1%	1/4W	
R26	1-247-863-91	CARBON 22K	5%	1/4W		R82	1-215-453-00	METAL 22K	1%	1/4W	
R27	1-249-431-11	CARBON 15K	5%	1/4W		R83	1-215-429-00	METAL 2.2K	1%	1/4W	
R28	1-249-428-11	CARBON 8.2K	5%	1/4W		R84	1-215-437-00	METAL 4.7K	1%	1/4W	
R29	1-249-408-11	CARBON 180	5%	1/4W		R85	1-215-463-00	METAL 56K	1%	1/4W	
R30	1-249-401-11	CARBON 47	5%	1/4W		R86	1-215-445-00	METAL 10K	1%	1/4W	
R31	1-249-417-11	CARBON 1K	5%	1/4W		R87	1-215-445-00	METAL 10K	1%	1/4W	
R32	1-249-417-11	CARBON 1K	5%	1/4W		R88	1-249-429-11	CARBON 10K	5%	1/4W	
R33	1-215-458-00	METAL 36K	1%	1/4W		R89	1-215-445-00	METAL 10K	1%	1/4W	
R34	1-249-435-11	CARBON 33K	5%	1/4W		R90	1-215-445-00	METAL 10K	1%	1/4W	
R35	1-249-435-11	CARBON 33K	5%	1/4W		R91	1-249-429-11	CARBON 10K	5%	1/4W	
R36	1-249-435-11	CARBON 33K	5%	1/4W		R92	1-215-449-00	METAL 15K	1%	1/4W	
R37	1-249-421-11	CARBON 2.2K	5%	1/4W		R93	1-215-449-00	METAL 15K	1%	1/4W	
R38	1-249-424-11	CARBON 3.9K	5%	1/4W		R94	1-215-461-00	METAL 47K	1%	1/4W	
R39	1-249-418-11	CARBON 1.2K	5%	1/4W		R95	1-215-461-00	METAL 47K	1%	1/4W	
R40	1-249-438-11	CARBON 56K	5%	1/4W		R96	1-215-451-00	METAL 18K	1%	1/4W	
R41	1-215-446-00	METAL 11K	1%	1/4W		R97	1-215-413-00	METAL 470	1%	1/4W	
R42	1-215-447-00	METAL 12K	1%	1/4W		R98	1-215-429-00	METAL 2.2K	1%	1/4W	
R43	1-215-463-00	METAL 56K	1%	1/4W		R99	1-215-417-00	METAL 680	1%	1/4W	
R44	1-215-439-00	METAL 5.6K	1%	1/4W		R100	1-247-887-00	CARBON 220K	5%	1/4W	
R45	1-215-439-00	METAL 5.6K	1%	1/4W		R101	1-249-429-11	CARBON 10K	5%	1/4W	
R46	1-215-449-00	METAL 15K	1%	1/4W		R102	1-215-451-00	METAL 18K	1%	1/4W	
R47	1-249-441-11	CARBON 100K	5%	1/4W		R103	1-215-413-00	METAL 470	1%	1/4W	
R48	1-247-863-91	CARBON 22K	5%	1/4W		R104	1-215-429-00	METAL 2.2K	1%	1/4W	
						R105	1-215-417-00	METAL 680	1%	1/4W	
						R106	1-247-887-00	CARBON 220K	5%	1/4W	
						R107	1-214-702-00	METAL 75	1%	1/4W	



Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R108	1-249-429-11	CARBON	10K 5% 1/4W	R168	1-215-457-00	METAL	33K 1% 1/4W
R109	1-215-417-00	METAL	680 1% 1/4W	R169	1-215-461-00	METAL	47K 1% 1/4W
R110	1-247-807-31	CARBON	100 5% 1/4W	R170	1-215-461-00	METAL	47K 1% 1/4W
R111	1-215-415-00	METAL	560 1% 1/4W	R171	1-215-461-00	METAL	47K 1% 1/4W
				R172	1-215-461-00	METAL	47K 1% 1/4W
R112	1-249-429-11	CARBON	10K 5% 1/4W	R173	1-215-441-00	METAL	6.8K 1% 1/4W
R113	1-215-445-00	METAL	10K 1% 1/4W	R174	1-215-425-00	METAL	1.5K 1% 1/4W
R114	1-215-457-00	METAL	33K 1% 1/4W	R175	1-215-425-00	METAL	1.5K 1% 1/4W
R115	1-215-457-00	METAL	33K 1% 1/4W	R176	1-215-425-00	METAL	1.5K 1% 1/4W
R116	1-215-457-00	METAL	33K 1% 1/4W	R177	1-215-441-00	METAL	6.8K 1% 1/4W
R117	1-215-459-00	METAL	39K 1% 1/4W	R178	1-215-445-00	METAL	10K 1% 1/4W
R118	1-215-459-00	METAL	39K 1% 1/4W	R179	1-215-457-00	METAL	33K 1% 1/4W
R119	1-215-459-00	METAL	39K 1% 1/4W	R180	1-249-429-11	CARBON	10K 5% 1/4W
R120	1-215-479-00	METAL	270K 1% 1/4W	R181	1-247-807-31	CARBON	100 5% 1/4W
R121	1-215-469-00	METAL	100K 1% 1/4W	R182	1-247-807-31	CARBON	100 5% 1/4W
R122	1-215-479-00	METAL	270K 1% 1/4W	R183	1-215-445-00	METAL	10K 1% 1/4W
R123	1-215-469-00	METAL	100K 1% 1/4W	R184	1-215-417-00	METAL	680 1% 1/4W
R124	1-215-427-00	METAL	1.8K 1% 1/4W	R185	1-249-393-11	CARBON	10 5% 1/4W
R125	1-215-468-00	METAL	91K 1% 1/4W	R186	1-215-924-00	METAL OXIDE	15K 5% 3W F
R126	1-215-443-00	METAL	8.2K 1% 1/4W	R187	1-215-875-11	METAL OXIDE	10K 5% 1W F
R127	1-215-469-00	METAL	100K 1% 1/4W	R188	1-215-396-00	METAL	91 1% 1/4W
R128	1-215-467-00	METAL	82K 1% 1/4W	R189	1-215-375-00	METAL	12 1% 1/4W
R129	1-215-451-00	METAL	18K 1% 1/4W	R190	1-215-375-00	METAL	12 1% 1/4W
R130	1-215-459-00	METAL	39K 1% 1/4W	R191	1-215-375-00	METAL	12 1% 1/4W
R131	1-249-417-11	CARBON	1K 5% 1/4W	R192	1-215-375-00	METAL	12 1% 1/4W
R132	1-215-459-00	METAL	39K 1% 1/4W	R193	1-215-375-00	METAL	12 1% 1/4W
R134	1-215-449-00	METAL	15K 1% 1/4W	R194	1-215-441-00	METAL	6.8K 1% 1/4W
R135	1-215-465-00	METAL	68K 1% 1/4W	R195	1-249-429-11	CARBON	10K 5% 1/4W
R136	1-215-451-00	METAL	18K 1% 1/4W	R196	1-215-441-00	METAL	6.8K 1% 1/4W
R137	1-215-471-00	METAL	120K 1% 1/4W	R197	1-249-429-11	CARBON	10K 5% 1/4W
R138	1-215-463-00	METAL	56K 1% 1/4W	R198	1-247-807-31	CARBON	100 5% 1/4W
R139	1-215-477-00	METAL	220K 1% 1/4W	R199	1-247-807-31	CARBON	100 5% 1/4W
R140	1-215-469-00	METAL	100K 1% 1/4W	R200	1-215-445-00	METAL	10K 1% 1/4W
R141	1-215-473-00	METAL	150K 1% 1/4W	R201	1-215-417-00	METAL	680 1% 1/4W
R142	1-215-469-00	METAL	100K 1% 1/4W	R202	1-249-393-11	CARBON	10 5% 1/4W
R143	1-215-469-00	METAL	100K 1% 1/4W	R203	1-215-924-00	METAL OXIDE	15K 5% 3W F
R144	1-215-469-00	METAL	100K 1% 1/4W	R204	1-215-875-11	METAL OXIDE	10K 5% 1W F
R145	1-215-469-00	METAL	100K 1% 1/4W	R205	1-215-391-00	METAL	56 1% 1/4W
R146	1-215-455-00	METAL	27K 1% 1/4W	R206	1-215-375-00	METAL	12 1% 1/4W
R147	1-215-461-00	METAL	47K 1% 1/4W	R207	1-215-375-00	METAL	12 1% 1/4W
R148	1-215-463-00	METAL	56K 1% 1/4W	R208	1-215-375-00	METAL	12 1% 1/4W
R149	1-215-449-00	METAL	15K 1% 1/4W	R209	1-215-375-00	METAL	12 1% 1/4W
R150	1-215-457-00	METAL	33K 1% 1/4W	R210	1-215-375-00	METAL	12 1% 1/4W
R151	1-215-461-00	METAL	47K 1% 1/4W	R211	1-215-445-00	METAL	10K 1% 1/4W
R152	1-215-461-00	METAL	47K 1% 1/4W	R212	1-215-417-00	METAL	680 1% 1/4W
R153	1-215-461-00	METAL	47K 1% 1/4W	R213	1-249-393-11	CARBON	10 5% 1/4W
R154	1-215-461-00	METAL	47K 1% 1/4W	R214	1-215-924-00	METAL OXIDE	15K 5% 3W F
R155	1-215-471-00	METAL	120K 1% 1/4W	R215	1-215-875-11	METAL OXIDE	10K 5% 1W F
R156	1-215-463-00	METAL	56K 1% 1/4W	R217	1-215-374-00	METAL	11 1% 1/4W
R157	1-215-477-00	METAL	220K 1% 1/4W	R218	1-215-375-00	METAL	12 1% 1/4W
R158	1-215-469-00	METAL	100K 1% 1/4W	R219	1-215-375-00	METAL	12 1% 1/4W
R159	1-215-473-00	METAL	150K 1% 1/4W	R220	1-215-375-00	METAL	12 1% 1/4W
R160	1-215-469-00	METAL	100K 1% 1/4W	R221	1-215-375-00	METAL	12 1% 1/4W
R161	1-215-469-00	METAL	100K 1% 1/4W	R222	1-215-419-00	METAL	820 1% 1/4W
R162	1-215-469-00	METAL	100K 1% 1/4W	R223	1-215-447-00	METAL	12K 1% 1/4W
R163	1-215-469-00	METAL	100K 1% 1/4W	R224	1-214-802-11	METAL	2.7 1% 1/2W
R164	1-215-455-00	METAL	27K 1% 1/4W	R225	1-214-804-11	METAL	3.3 1% 1/2W
R165	1-215-461-00	METAL	47K 1% 1/4W	R226	1-214-802-11	METAL	2.7 1% 1/2W
R166	1-215-463-00	METAL	56K 1% 1/4W	R227	1-214-804-11	METAL	3.3 1% 1/2W
R167	1-215-449-00	METAL	15K 1% 1/4W				



Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R228	1-214-802-11	METAL 2.7	1% 1/2W	R287	1-249-427-11	CARBON 6.8K	5% 1/4W
R229	1-214-804-11	METAL 3.3	1% 1/2W	R288	1-247-807-31	CARBON 100	5% 1/4W
R230	1-215-469-00	METAL 100K	1% 1/4W	R289	1-249-420-11	CARBON 1.8K	5% 1/4W
R231	1-215-469-00	METAL 100K	1% 1/4W	R291	1-249-441-11	CARBON 100K	5% 1/4W
R232	1-249-429-11	CARBON 10K	5% 1/4W	R292	1-249-429-11	CARBON 10K	5% 1/4W
R233	1-247-901-11	CARBON 820K	5% 1/4W	R293	1-249-429-11	CARBON 10K	5% 1/4W
R234	1-247-901-11	CARBON 820K	5% 1/4W	R294	1-249-441-11	CARBON 100K	5% 1/4W
R235	1-247-897-11	CARBON 560K	5% 1/4W	R295	1-247-807-31	CARBON 100	5% 1/4W
R236	1-247-897-11	CARBON 560K	5% 1/4W	R296	1-249-417-11	CARBON 1K	5% 1/4W
R237	1-249-441-11	CARBON 100K	5% 1/4W	R301	1-215-407-00	METAL 270	1% 1/4W
R238	1-247-863-91	CARBON 22K	5% 1/4W	R302	1-215-436-00	METAL 4.3K	1% 1/4W
R239	1-247-863-91	CARBON 22K	5% 1/4W	R303	1-215-445-00	METAL 10K	1% 1/4W
R240	1-215-467-00	METAL 82K	1% 1/4W	R304	1-215-455-00	METAL 27K	1% 1/4W
R241	1-215-483-00	METAL 390K	1% 1/4W	R305	1-215-401-11	METAL 150	1% 1/4W
R242	1-215-473-00	METAL 150K	1% 1/4W	R306	1-215-445-00	METAL 10K	1% 1/4W
R243	1-215-457-00	METAL 33K	1% 1/4W	R307	1-215-455-00	METAL 27K	1% 1/4W
R244	1-215-457-00	METAL 33K	1% 1/4W	R308	1-215-445-00	METAL 10K	1% 1/4W
R245	1-215-465-00	METAL 68K	1% 1/4W	R309	1-215-436-00	METAL 4.3K	1% 1/4W
R246	1-215-453-00	METAL 22K	1% 1/4W	R310	1-215-407-00	METAL 270	1% 1/4W
R247	1-215-457-00	METAL 33K	1% 1/4W	R311	1-215-445-00	METAL 10K	1% 1/4W
R248	1-215-469-00	METAL 100K	1% 1/4W	R312	1-215-401-11	METAL 150	1% 1/4W
R249	1-249-416-11	CARBON 820	5% 1/4W	R313	1-215-407-00	METAL 270	1% 1/4W
R250	1-249-417-11	CARBON 1K	5% 1/4W	R314	1-215-436-00	METAL 4.3K	1% 1/4W
R251	1-247-807-31	CARBON 100	5% 1/4W	R315	1-215-445-00	METAL 10K	1% 1/4W
R252	1-215-463-00	METAL 56K	1% 1/4W	R316	1-215-455-00	METAL 27K	1% 1/4W
R253	1-215-461-00	METAL 47K	1% 1/4W	R317	1-215-401-11	METAL 150	1% 1/4W
R254	1-249-413-11	CARBON 470	5% 1/4W	R318	1-215-445-00	METAL 10K	1% 1/4W
R255	1-249-429-11	CARBON 10K	5% 1/4W	R319	1-215-455-00	METAL 27K	1% 1/4W
R256	1-247-843-11	CARBON 3.3K	5% 1/4W	R320	1-215-445-00	METAL 10K	1% 1/4W
R257	1-247-843-11	CARBON 3.3K	5% 1/4W	R321	1-215-436-00	METAL 4.3K	1% 1/4W
R258	1-247-863-91	CARBON 22K	5% 1/4W	R322	1-215-407-00	METAL 270	1% 1/4W
R259	1-249-429-11	CARBON 10K	5% 1/4W	R323	1-215-445-00	METAL 10K	1% 1/4W
R260	1-247-863-91	CARBON 22K	5% 1/4W	R324	1-215-401-11	METAL 150	1% 1/4W
R261	1-247-863-91	CARBON 22K	5% 1/4W	R325	1-247-903-00	CARBON 1M	5% 1/4W
R262	1-249-441-11	CARBON 100K	5% 1/4W	R326	1-247-897-11	CARBON 560K	5% 1/4W
R263	1-215-910-00	METAL OXIDE 68	5% 3W F	R500	1-215-491-00	METAL 820K	1% 1/4W
R264	1-215-910-00	METAL OXIDE 68	5% 3W F	<VARIABLE RESISTOR>			
R265	1-215-910-00	METAL OXIDE 68	5% 3W F	RV1	1-241-763-11	RES, ADJ, CERMET 4.7K	
R266	1-215-910-00	METAL OXIDE 68	5% 3W F	RV2	1-241-763-11	RES, ADJ, CERMET 4.7K	
R268	1-249-421-11	CARBON 2.2K	5% 1/4W	RV3	1-238-019-11	RES, ADJ, CARBON 47K	
R269	1-249-421-11	CARBON 2.2K	5% 1/4W	RV4	1-238-019-11	RES, ADJ, CARBON 47K	
R270	1-249-429-11	CARBON 10K	5% 1/4W	RV5	1-241-764-11	RES, ADJ, CARBON 10K	
R271	1-249-441-11	CARBON 100K	5% 1/4W	RV6	1-241-764-11	RES, ADJ, CARBON 10K	
R272	1-249-429-11	CARBON 10K	5% 1/4W	RV7	1-241-764-11	RES, ADJ, CARBON 10K	
R273	1-215-437-00	METAL 4.7K	1% 1/4W	RV8	1-241-764-11	RES, ADJ, CARBON 10K	
R274	1-249-425-11	CARBON 4.7K	5% 1/4W	RV9	1-241-764-11	RES, ADJ, CARBON 10K	
R275	1-249-425-11	CARBON 4.7K	5% 1/4W	RV10	1-241-764-11	RES, ADJ, CARBON 10K	
R276	1-249-429-11	CARBON 10K	5% 1/4W	RV11	1-241-764-11	RES, ADJ, CARBON 10K	
R277	1-249-429-11	CARBON 10K	5% 1/4W	RV12	1-241-764-11	RES, ADJ, CARBON 10K	
R278	1-249-420-11	CARBON 1.8K	5% 1/4W	RV13	1-241-764-11	RES, ADJ, CARBON 10K	
R279	1-249-420-11	CARBON 1.8K	5% 1/4W	RV14	1-241-764-11	RES, ADJ, CARBON 10K	
R280	1-249-441-11	CARBON 100K	5% 1/4W	RV15	1-241-764-11	RES, ADJ, CARBON 10K	
R281	1-249-441-11	CARBON 100K	5% 1/4W	RV16	1-241-764-11	RES, ADJ, CARBON 10K	
R282	1-249-417-11	CARBON 1K	5% 1/4W	RV17	1-241-764-11	RES, ADJ, CARBON 10K	
R283	1-249-441-11	CARBON 100K	5% 1/4W	RV18	1-241-764-11	RES, ADJ, CARBON 10K	
R284	1-249-429-11	CARBON 10K	5% 1/4W	RV19	1-241-764-11	RES, ADJ, CARBON 10K	
R285	1-214-970-00	METAL 1.8M	1% 1/4W	RV20	1-241-764-11	RES, ADJ, CARBON 10K	
R286	1-249-427-11	CARBON 6.8K	5% 1/4W				

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
RV21	1-241-764-11	RES, ADJ, CARBON 10K		C2	1-126-961-11	ELECT 2.2MF	20% 50V
RV22	1-241-764-11	RES, ADJ, CARBON 10K		C3	1-124-903-11	ELECT 1MF	20% 50V
RV23	1-241-764-11	RES, ADJ, CARBON 10K		C4	1-163-117-00	CERAMIC CHIP 100PF	5% 50V
RV24	1-241-764-11	RES, ADJ, CARBON 10K		C6	1-136-166-00	FILM 0.12MF	5% 50V
RV25	1-241-764-11	RES, ADJ, CARBON 10K					
RV26	1-241-764-11	RES, ADJ, CARBON 10K					
RV27	1-241-764-11	RES, ADJ, CARBON 10K					
RV28	1-241-764-11	RES, ADJ, CARBON 10K		DA1	* 1-766-312-11	PIN, CONNECTOR (PC BOARD) 3P	
RV29	1-241-764-11	RES, ADJ, CARBON 10K		DA2	* 1-766-312-11	PIN, CONNECTOR (PC BOARD) 3P	
RV30	1-241-764-11	RES, ADJ, CARBON 10K					
RV31	1-241-764-11	RES, ADJ, CARBON 10K					
RV32	1-241-764-11	RES, ADJ, CARBON 10K					
RV33	1-241-764-11	RES, ADJ, CARBON 10K					
RV34	1-241-764-11	RES, ADJ, CARBON 10K		Q1	8-729-230-49	TRANSISTOR 2SC2712-YG	
RV35	1-241-764-11	RES, ADJ, CARBON 10K		Q2	8-729-216-22	TRANSISTOR 2SA1162-G	
				Q3	8-729-230-49	TRANSISTOR 2SC2712-YG	
RV36	1-241-764-11	RES, ADJ, CARBON 10K		Q4	8-729-216-22	TRANSISTOR 2SA1162-G	
RV37	1-241-764-11	RES, ADJ, CARBON 10K					
RV38	1-241-764-11	RES, ADJ, CARBON 10K					
RV39	1-241-764-11	RES, ADJ, CARBON 10K					
RV40	1-241-764-11	RES, ADJ, CARBON 10K					
RV41	1-241-764-11	RES, ADJ, CARBON 10K					
RV42	1-241-764-11	RES, ADJ, CARBON 10K					
RV43	1-241-764-11	RES, ADJ, CARBON 10K					
RV44	1-241-764-11	RES, ADJ, CARBON 10K					
RV45	1-241-764-11	RES, ADJ, CARBON 10K					
RV46	1-241-764-11	RES, ADJ, CARBON 10K					
RV47	1-241-764-11	RES, ADJ, CARBON 10K					
RV48	1-241-764-11	RES, ADJ, CARBON 10K					
RV49	1-241-764-11	RES, ADJ, CARBON 10K					
RV50	1-241-764-11	RES, ADJ, CARBON 10K					
RV51	1-241-764-11	RES, ADJ, CARBON 10K					
RV52	1-241-763-11	RES, ADJ, CERMET 4.7K					
RV53	1-241-764-11	RES, ADJ, CERMET 10K					

DB HA HB HC Y X N

Ref.No.	Part No.	Description	Remark
R3	1-249-411-11	CARBON	330 5% 1/4W
R4	1-249-411-11	CARBON	330 5% 1/4W
R5	1-247-705-11	CARBON	270 5% 1/4W
R6	1-247-705-11	CARBON	270 5% 1/4W
<CONNECTOR>			
W1	* 1-506-602-11	PLUG, L TYPE (2.0MM PITCH) 5P	
W2	* 1-506-602-11	PLUG, L TYPE (2.0MM PITCH) 5P	

* A-1372-017-A HA BOARD, COMPLETE *****			
<CONNECTOR>			
CN321*1-566-045-11 PIN, CONNECTOR 6P			
<SWITCH>			
SW1	1-692-490-11	SWITCH, TACTILE (1 KEY)	
SW2	1-692-490-11	SWITCH, TACTILE (1 KEY)	
SW3	1-692-490-11	SWITCH, TACTILE (1 KEY)	
SW4	1-692-490-11	SWITCH, TACTILE (1 KEY)	
SW5	1-692-490-11	SWITCH, TACTILE (1 KEY)	
SW6	1-692-490-11	SWITCH, TACTILE (1 KEY)	
SW7	1-692-490-11	SWITCH, TACTILE (1 KEY)	

* A-1372-602-A HB BOARD, COMPLETE *****			
<CONNECTOR>			
CN322*1-566-047-11 PIN, CONNECTOR 8P			
<SWITCH>			
SW8	1-692-491-11	SWITCH, TACTILE (1 KEY)	
SW9	1-692-490-11	SWITCH, TACTILE (1 KEY)	
SW10	1-692-490-11	SWITCH, TACTILE (1 KEY)	
SW11	1-692-490-11	SWITCH, TACTILE (1 KEY)	
SW12	1-692-490-11	SWITCH, TACTILE (1 KEY)	
SW13	1-692-490-11	SWITCH, TACTILE (1 KEY)	
SW14	1-692-490-11	SWITCH, TACTILE (1 KEY)	
SW15	1-692-490-11	SWITCH, TACTILE (1 KEY)	
SW16	1-692-490-11	SWITCH, TACTILE (1 KEY)	

Ref.No.	Part No.	Description	Remark
	* A-1372-037-A	HC BOARD, COMPLETE *****	
<CONNECTOR>			
CN327*1-566-044-11 PIN, CONNECTOR 5P			
<VARIABLE RESISTOR>			
RV1	1-223-406-11	RES, VAR, CARBON 20K	
RV2	1-237-413-11	RES, VAR, CARBON 10K	

* A-1373-475-A Y BOARD, COMPLETE *****			
* 4-365-850-00 HOLDER, LED			
<CONNECTOR>			
CN436*1-566-043-11 PIN, CONNECTOR 4P			
<DIODE>			
D401	8-719-420-94	DIODE LN342GPH	
D402	8-719-404-30	DIODE LN242RPH	

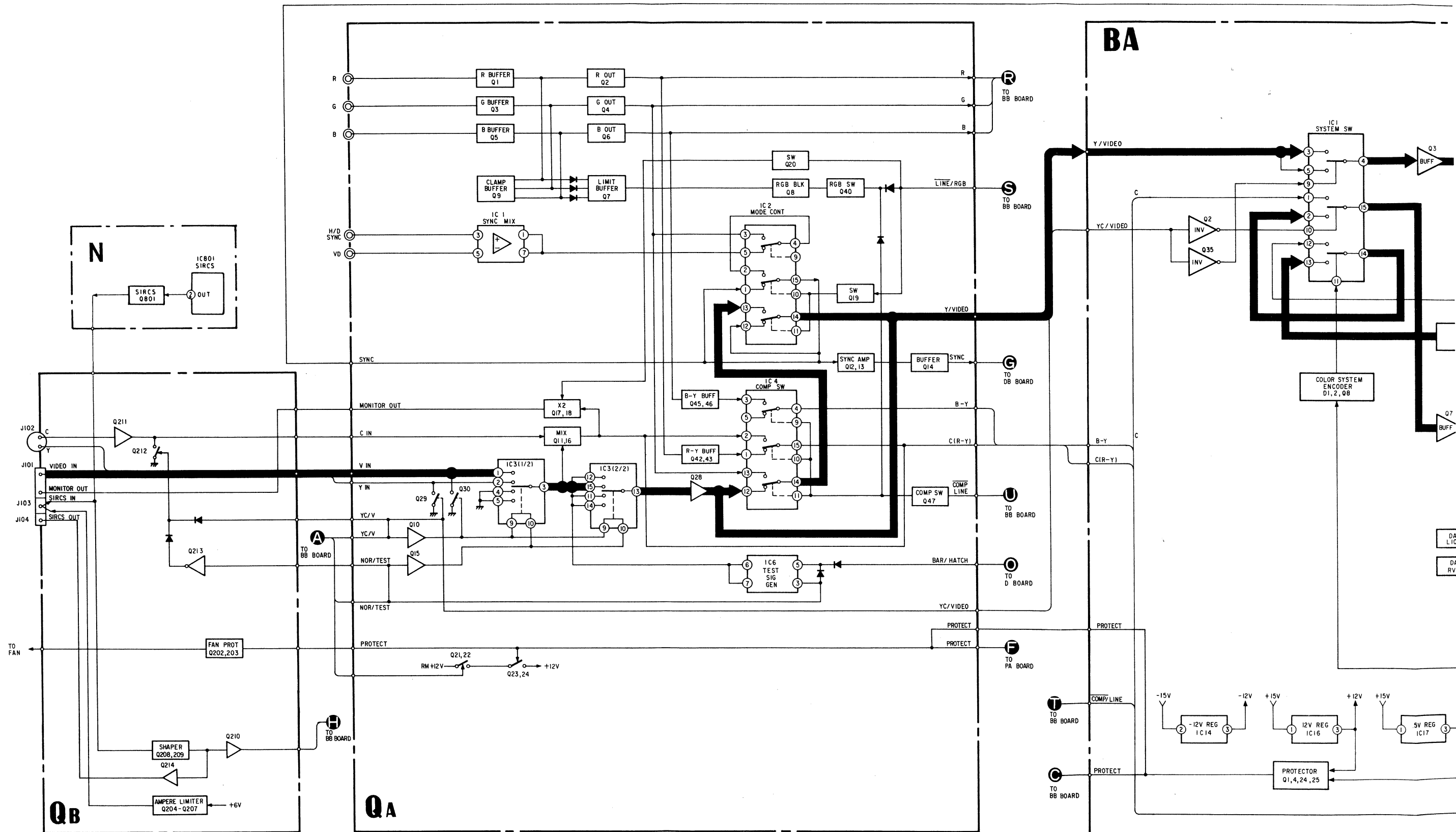
* 1-621-051-21 X BOARD *****			
1-518-590-11 LAMP, PILOT (WITH HOLDER) * 1-535-615-11 TERMINAL (LAMP SOCKET)			
<CRYSTAL>			
X1	* 1-566-041-11	PIN, CONNECTOR 2P	
X2	* 1-566-041-11	PIN, CONNECTOR 2P	

* 1-672-042-11 N BOARD *****			
* 1-716-228-11 PWB, FB/FC/N/QB COMBINED			
<CAPACITOR>			
C801	1-126-786-11	ELECT	47MF 20% 16V
<CONNECTOR>			
CN801*1-566-042-11 PIN, CONNECTOR 3P			

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
		<IC>				ACCESSORIES AND PACKING MATERIALS	

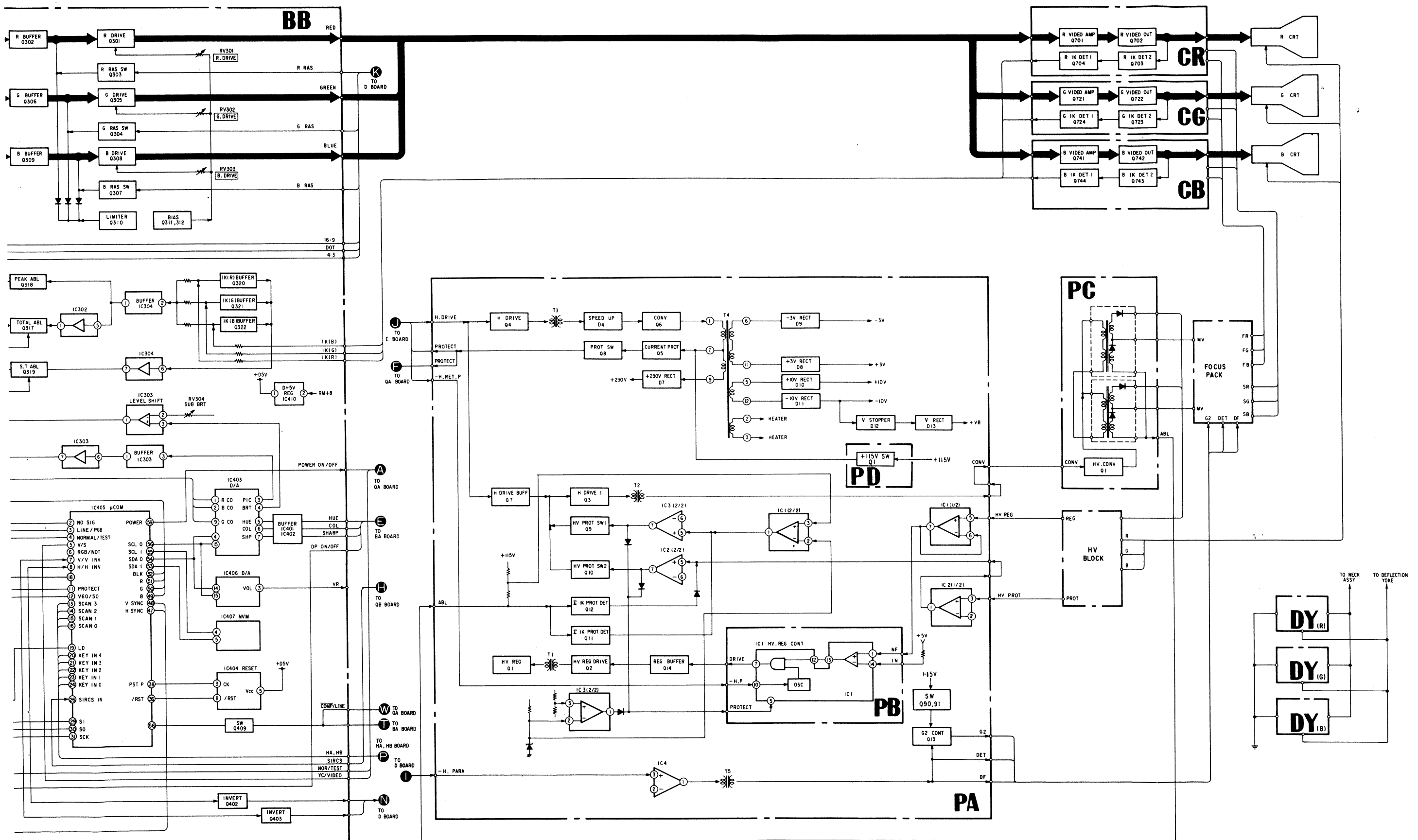
IC801	8-742-088-10	HYB IC SBX1780-51(10)				△1-534-827-14 CORD, POWER (10A/125V)(U/C)	
		<TRANSISTOR>				△1-590-151-11 CORD SET, POWER (10A/250V)(AEP)	
						3-865-079-11 MANUAL, INSTRUCTION (ENGLISH)	
						3-865-080-11 MANUAL (ENGLISH)	
Q801	8-729-230-49	TRANSISTOR 2SC2712-YG				*4-039-963-01 CUSHION (UPPER) (ASSY)	
		<RESISTOR>					
						*4-039-964-01 CUSHION (LOWER) (ASSY)	
						*4-039-966-01 SPACER	
						*4-045-532-01 HOLDER	
R801	1-216-659-11	METAL CHIP 2.2K 0.50% 1/10W				*4-045-533-01 BOX, ACCESSORY	
						*4-046-249-01 CUSHION	
						4-378-602-01 SPACER, 100	
						4-378-685-01 SPACER, 200	
						4-378-686-01 SPACER (200), PICTURE TUBE	
						7-621-846-40 SCREW,WOOD +R 4.1X16	
		MISCELLANEOUS				REMOTE COMMANDER	
		*****				*****	
		△1-237-582-13 RESISTOR ASSY, HIGH-VOLTAGE					
		△1-413-289-12 REGULATOR, SWITCHING (TK-15)					
		△1-451-243-13 DEFLECTION YOKE (Y636PA)					
		△1-452-302-11 PICTURE TUBE NECK ASSEMBLY					
		△1-452-443-13 NECK ASSY, PICTURE TUBE (NA367)					
		△1-453-108-12 DC BLOCK, HIGH-VOLTAGE					
		△1-532-299-11 FUSE, TIME-LAG (5A/250V)(AEP)					
		△1-532-747-11 FUSE, GRASS TUBE (5A/125V)(U/C)					
		1-541-449-11 FAN, DC (WITH SENSOR)					
		△1-552-437-11 SWITCH, LEVER					
		1-698-046-11 FAN, DC					
		*1-900-216-93 CONNECTOR ASSY, MICRO 3P					
V902	△8-736-244-05	PICTURE TUBE 07MS(G)				1-418-228-11 COMMANDER, REMOTE (RM-PJV20)	
V903	△8-736-245-05	PICTURE TUBE 07MS(B)				4-040-086-11 BATTERY COVER (FOR RM-PJV20)	
V901	△8-736-246-05	PICTURE TUBE 07MS(R)					

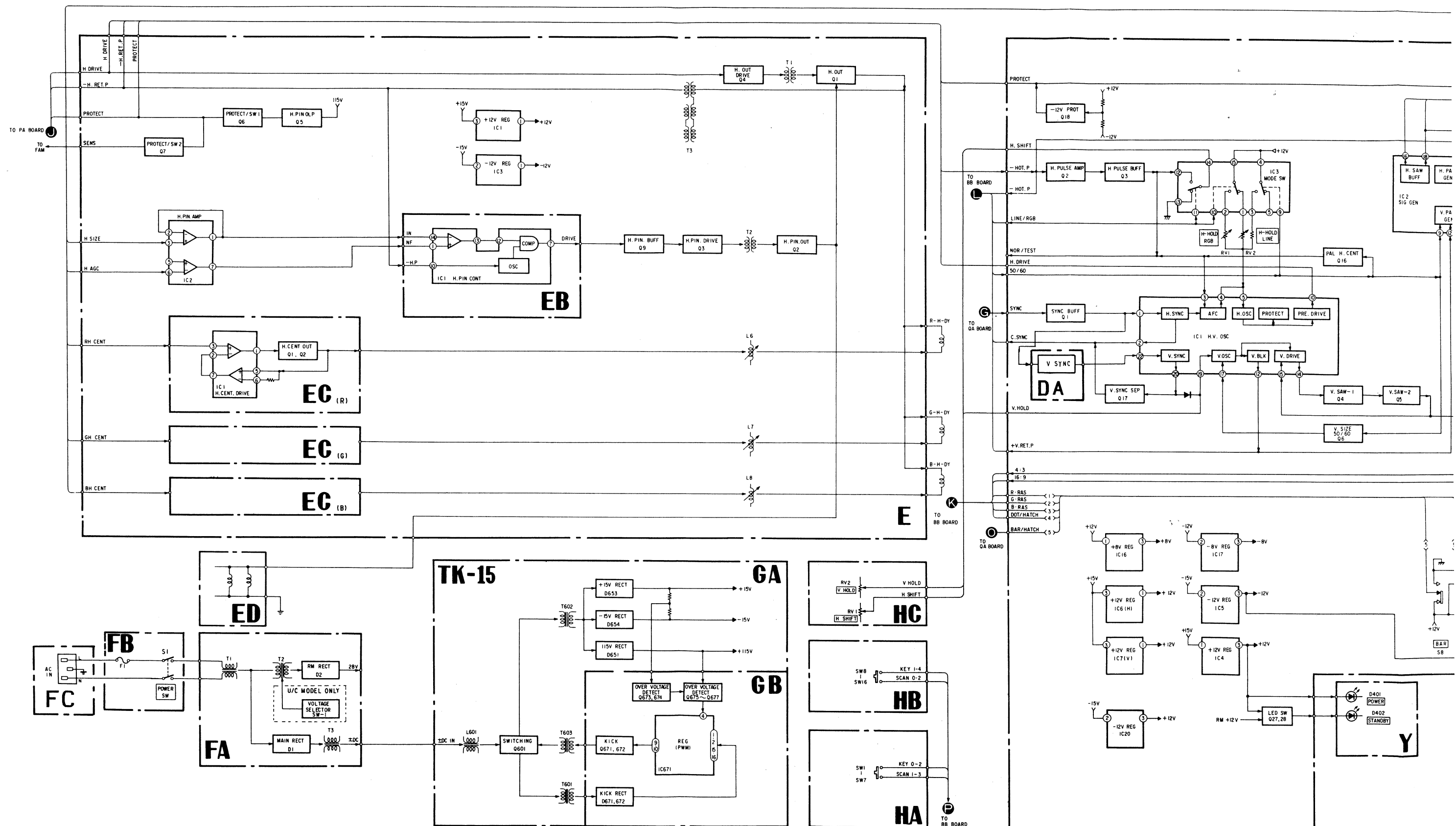
SECTION 9 BLOCK DIAGRAM

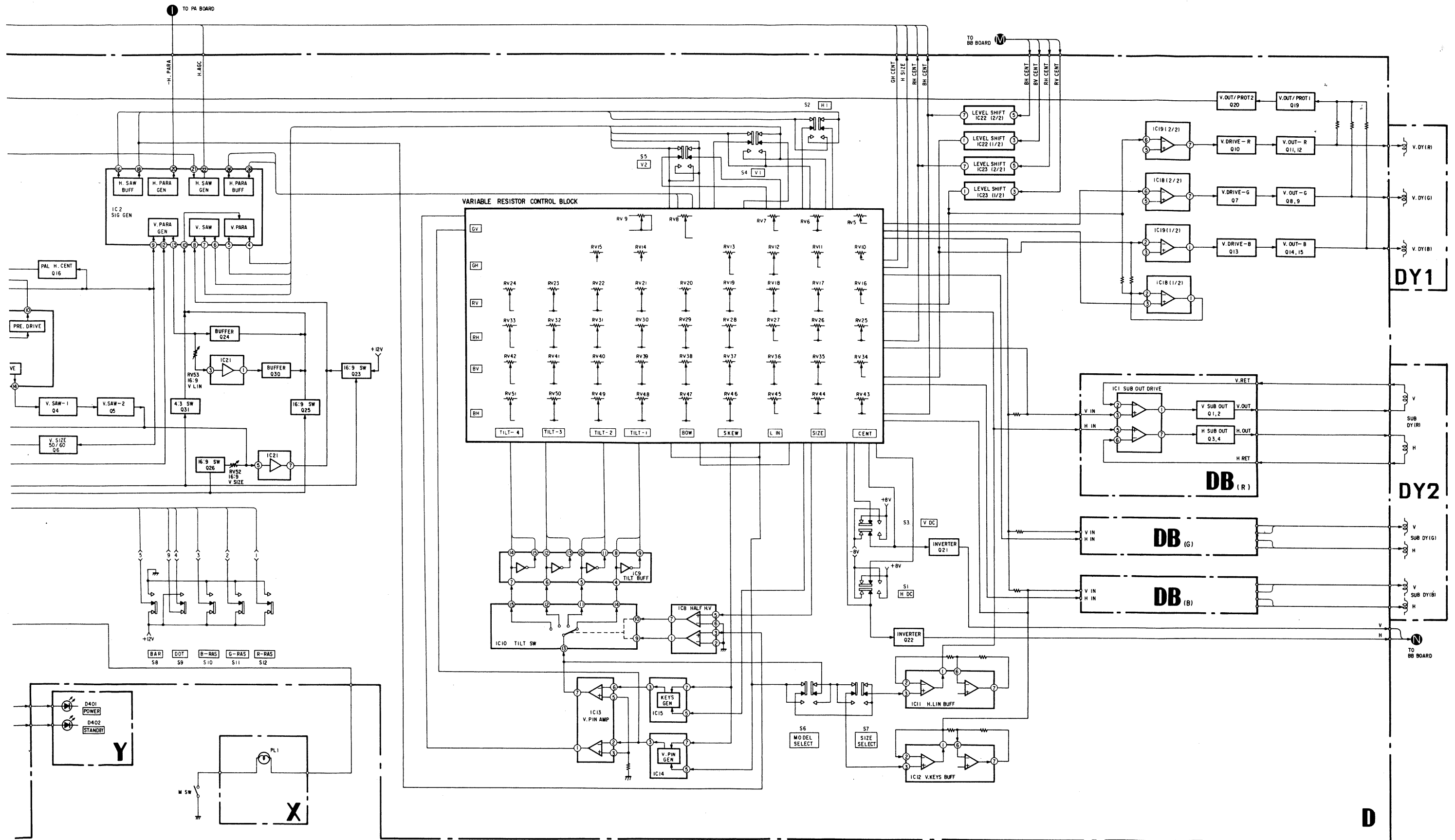




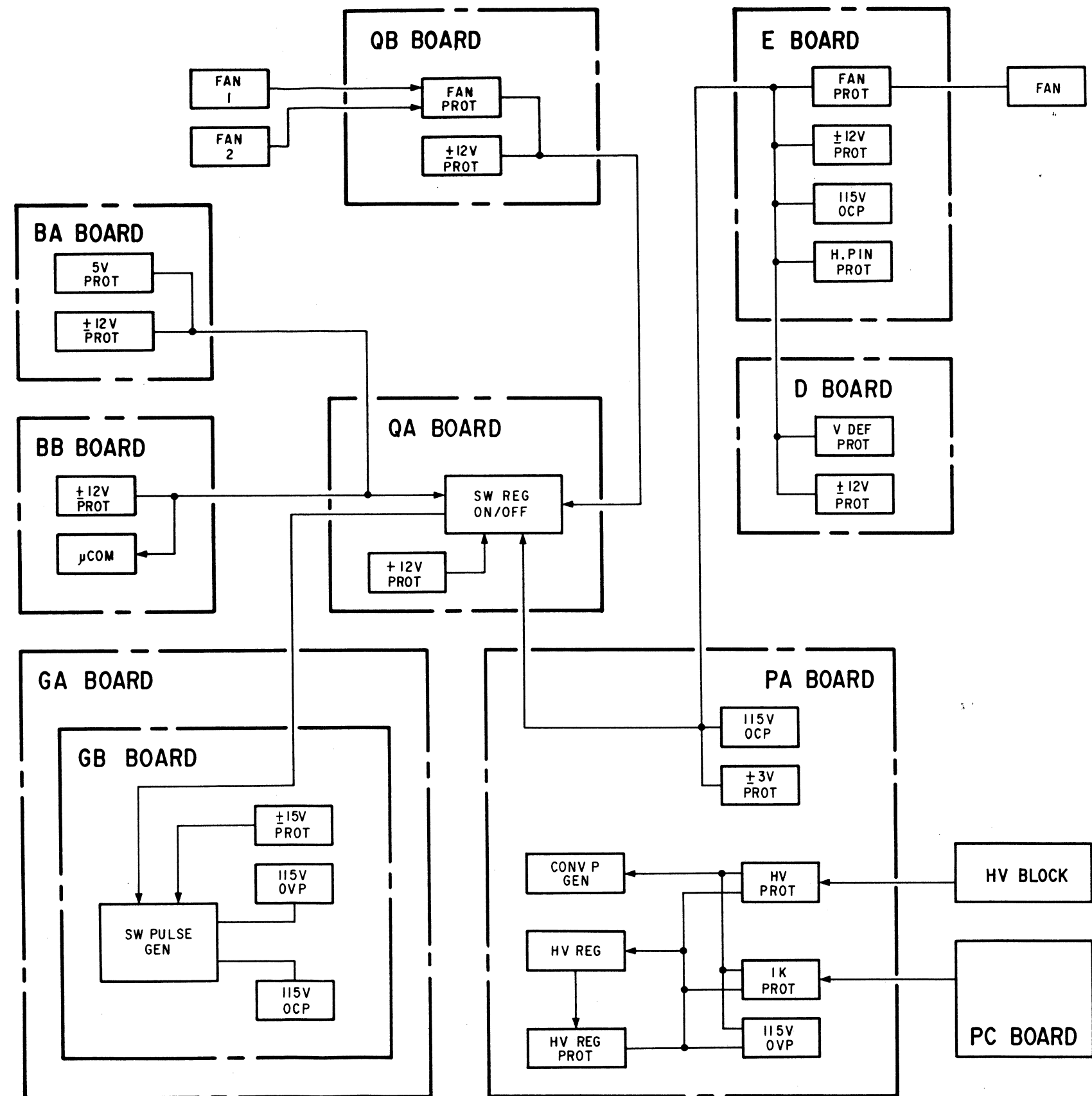






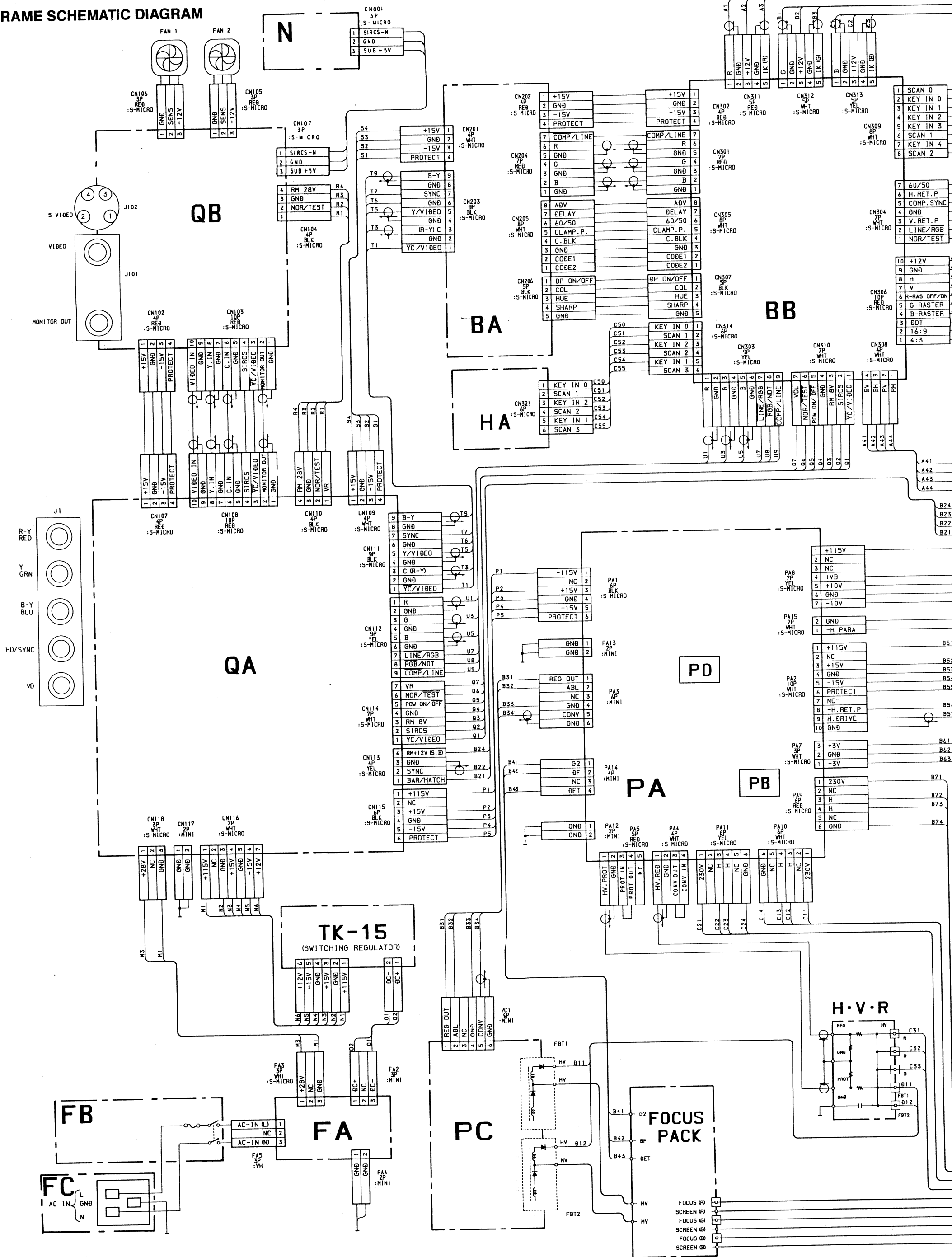


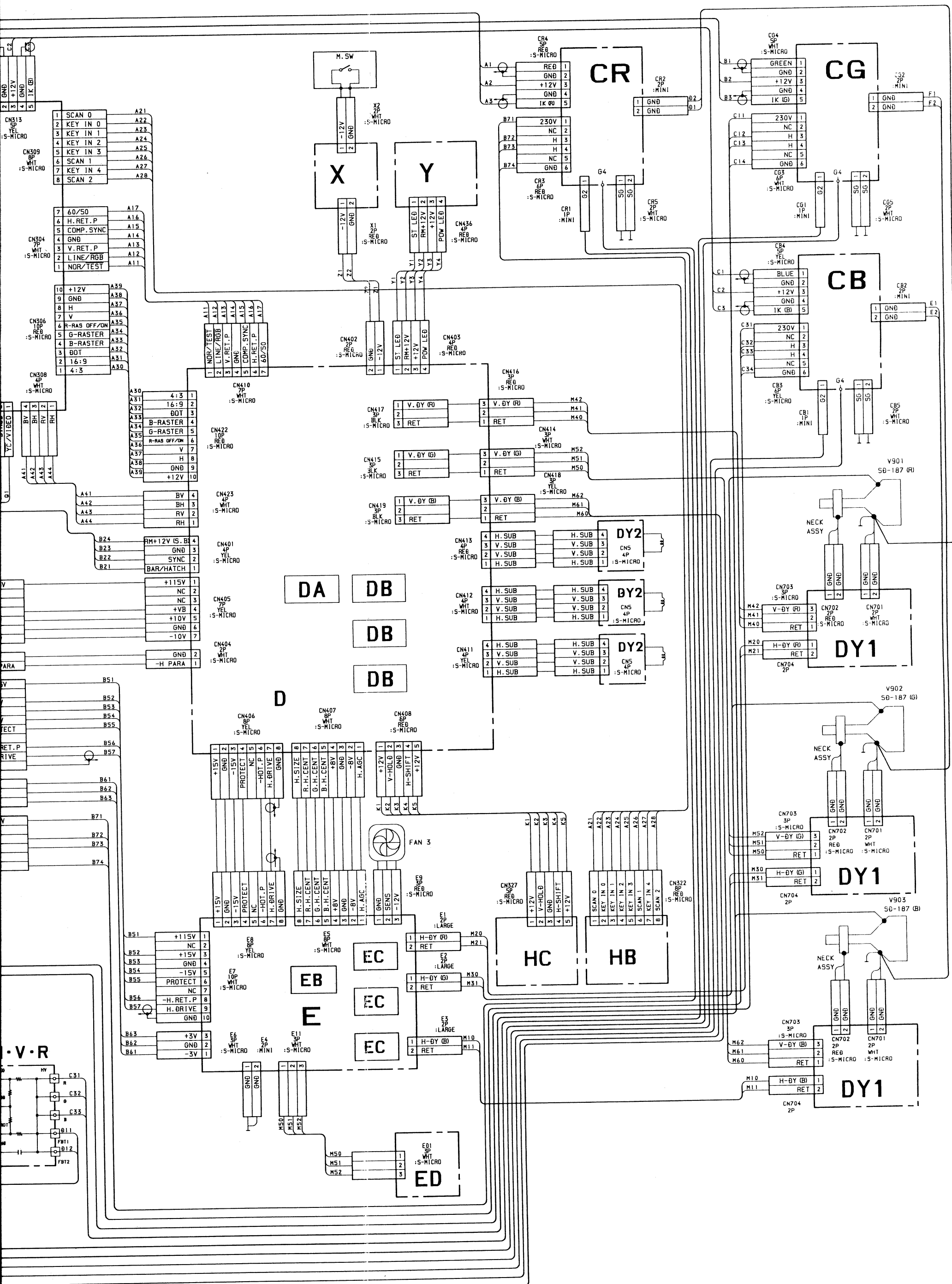
PROTECTOR BLOCK DIAGRAM



SECTION 10 DIAGRAM

10-1. FRAME SCHEMATIC DIAGRAM





10-2. SCHEMATIC DIAGRAMS AND
PRINTED WIRING BOARDS

NOTE:

- All capacitors are in μF unless otherwise noted. pF : $\mu\mu\text{F}$
- Capacitors without voltage indication are all 50V.
- All resistors are in ohms, 1/4W in resistance, 1/10W in chip resistance.
 $\text{k}\Omega = 1000\Omega$, $\text{M}\Omega = 1000\text{k}\Omega$
-  : nonflammable resistor.
-  : fusible resistor.
-  : internal component.
-  : panel designation and adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- # marked in these schematic diagrams signifies not mounted.
- The components identified by  in this basic schematic diagram have been carefully factory-selected for each set in order to satisfy regulation regarding X-ray radiation.
Should replacement be required, replace only with the value originally used.
- When replacing components identified by , make the necessary adjustments indicated. If results do not meet the specified value, change the component identified by  and repeat the adjustment until the specified value is achieved.
- When replacing the part in below table, be sure to perform the related adjustment.

Part replaced (▣)	Adjustment (▣)
IC2, Q10, D16, D22, C30, R15, R35, R36, R37, R38, R40, R41, R42, R43, R44, RV1 (PA BOARD)	HV HOLD DOWN (R38, RV1)
IC1, Q14, D17, C3, C39, C56, L2, R31, R32, R33, R34, R46, R47, R48, R82, R83, R84, RV2 (PA BOARD) IC1, R3, R4, R7, R14 (PB BOARD)	HV REGULATOR (R48, RV2)
IC3, Q9, Q11, Q12, D15, D20, R16, R18, R19, R20, R21, R22, R23, R50, R51, R52, R53, R54, R69 (PA BOARD)	BEAM CURRENT PROTECTOR (R23)
IC1, D18, R18, R85, R86, R87, R88, R89 (PA BOARD) C1, C2, FBT1, FBT2, L1, L2 (PB BOARD) HVR	OVP CIRCUIT CONFIRMATION (R88, R89)

- Voltage value is the reference value between it and the earth, when color bar signal is received from color bar generator (digital multi-meter used : 10M ohms/V DC).
- Unit of voltage values is V (volt).
- NO MARK : PAL MODE.
- () : SECAM MODE.
- < > : NTSC 3.58 MODE
- « » : NTSC 4.43 MODE
- * : Measurement disabled.
-  : B + line, B - line.
(Actual measured value may be different).
- Circled numbers are waveform references.

Reference information

RESISTOR	: RN METAL FILM
	: RC SOLID
	: FPRD NONFRAMMABLE CARBON
	: FUSE NONFLAMMABLE FUSIBLE
	: RS NONFLAMMABLE METAL OXIDE
	: RB NONFLAMMABLE CEMENT
	: RW NONFLAMMABLE WIREWOUND
	: ※ ADJUSTMENT RESISTOR

COIL : LF-8L MICRO INDUCTOR

CAPACITOR	: TA TANTALUM
	: PS STYROL
	: PP POLYPROPYLENE
	: PT MYLAR
	: MPS METALIZED POLYESTER
	: MPP METALIZED POLYPROPYLENE
	: ALB BIPOLAR
	: ALT HIGH TEMPERATURE
	: ALR HIGH RIPPLE

Note: The component identified by mark  are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

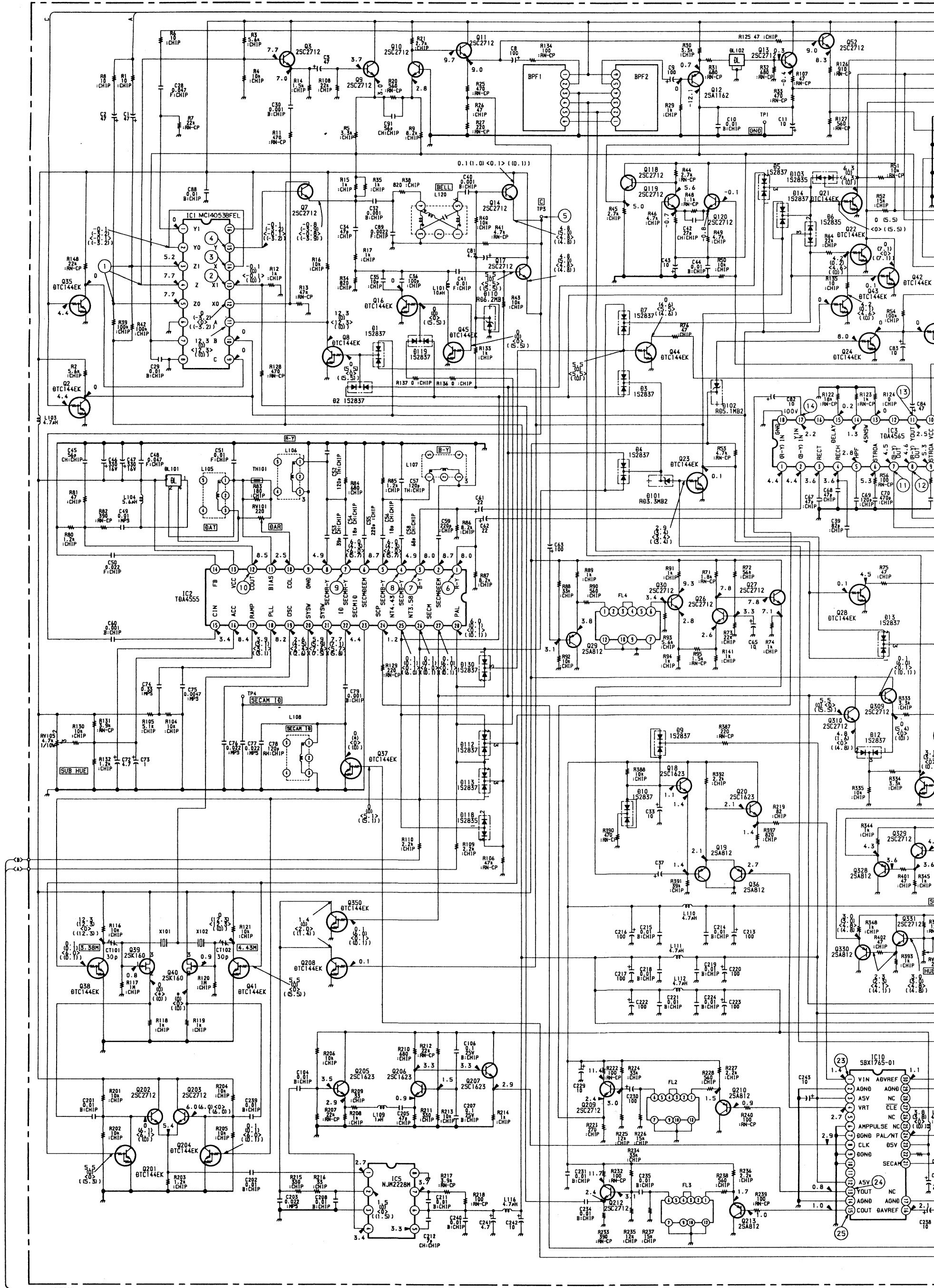
1) ① NTSC 0.8 Vp-p (H)	14) NTSC 0.8 Vp-p (H)	15) PAL 1.9 Vp-p (H)	15) SECAM 1.4 Vp-p (H)
1) ③ PAL 0.34Vp-p (H)	15) NTSC 1.9 Vp-p (H)	14) PAL 1.3 Vp-p (H)	16) SECAM 1.2 Vp-p (H)
1) ④ PAL 0.7 Vp-p (H)	16) NTSC 1.4 Vp-p (H)	17) PAL 1.2 Vp-p (H)	17) SECAM 1.0 Vp-p (H)
1) ⑤ PAL 0.12Vp-p (H)	17) NTSC 0.8 Vp-p (H)	18) PAL 1.6 Vp-p (H)	18) SECAM 1.4 Vp-p (H)
1) ⑤ NTSC4.43 0.06Vp-p (H)	18) NTSC 1.2 Vp-p (H)	19) PAL 1.2 Vp-p (H)	19) SECAM 1.0 Vp-p (H)
1) ⑥ NTSC 0.8 Vp-p (H)	19) NTSC 1.2 Vp-p (H)	20) PAL 1.2 Vp-p (H)	20) SECAM 1.0 Vp-p (H)
1) ⑦ NTSC 1.0 Vp-p (H)	20) NTSC 1.2 Vp-p (H)	21) 6.2 Vp-p (H)	22) 9.0 Vp-p (H)
1) ⑩ PAL 1.2 Vp-p (H)	23) PAL 1.6 Vp-p (H)	23) SECAM 1.3 Vp-p (H)	23) NTSC 1.4 Vp-p (H)
1) ⑪ PAL 1.6 Vp-p (H)	24) PAL 1.2 Vp-p (H)	24) SECAM 1.0 Vp-p (H)	24) NTSC 1.0 Vp-p (H)
1) ⑫ PAL 1.2 Vp-p (H)	25) PAL 0.8 Vp-p (H)	25) NTSC3.58 0.75 Vp-p (H)	25) NTSC4.43 0.45Vp-p (H)
1) ⑬ PAL 0.4 Vp-p (H)			
1) ⑭ SECAM 0.75 Vp-p (H)			

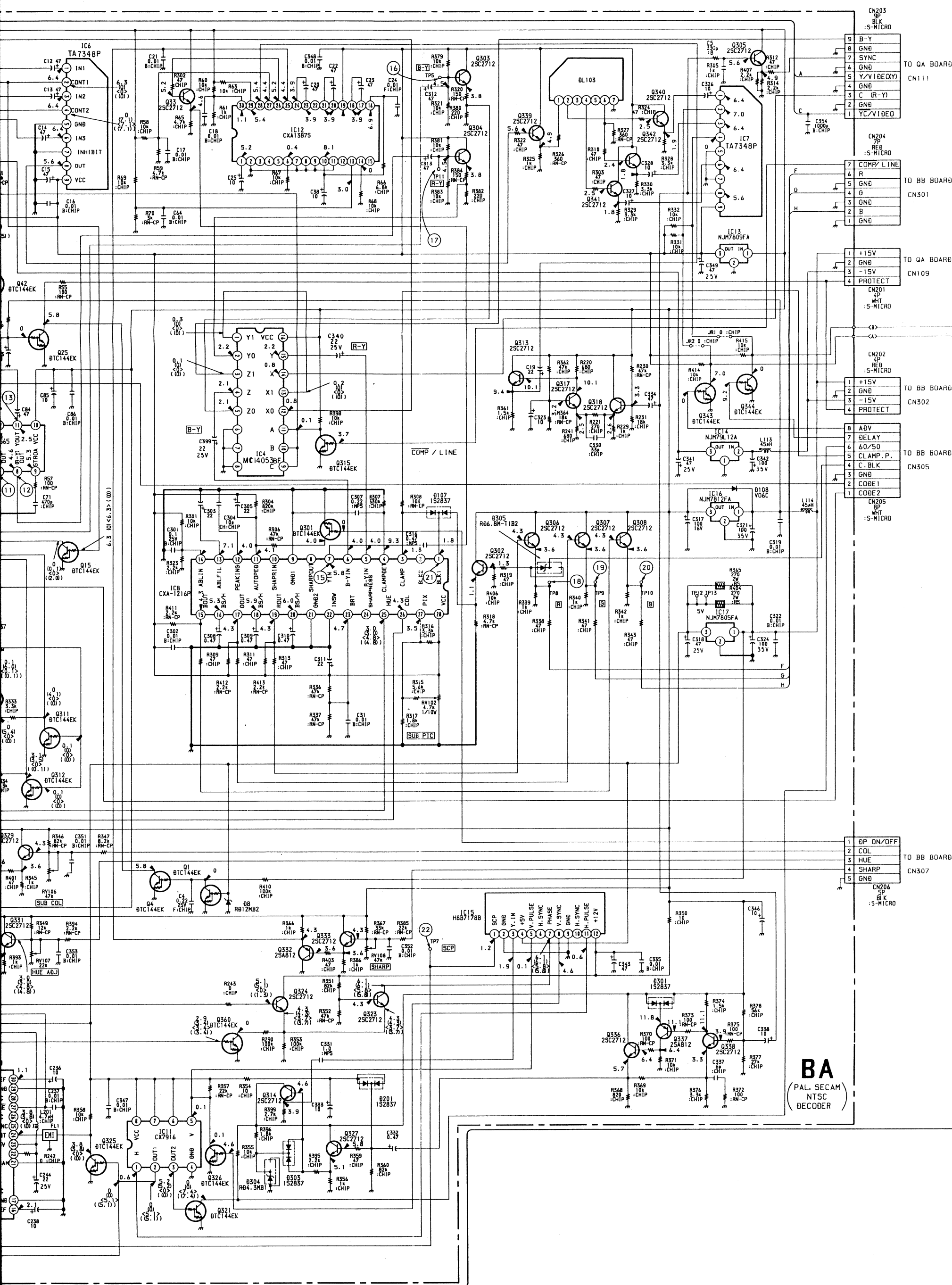
BA BOARD OPERATION

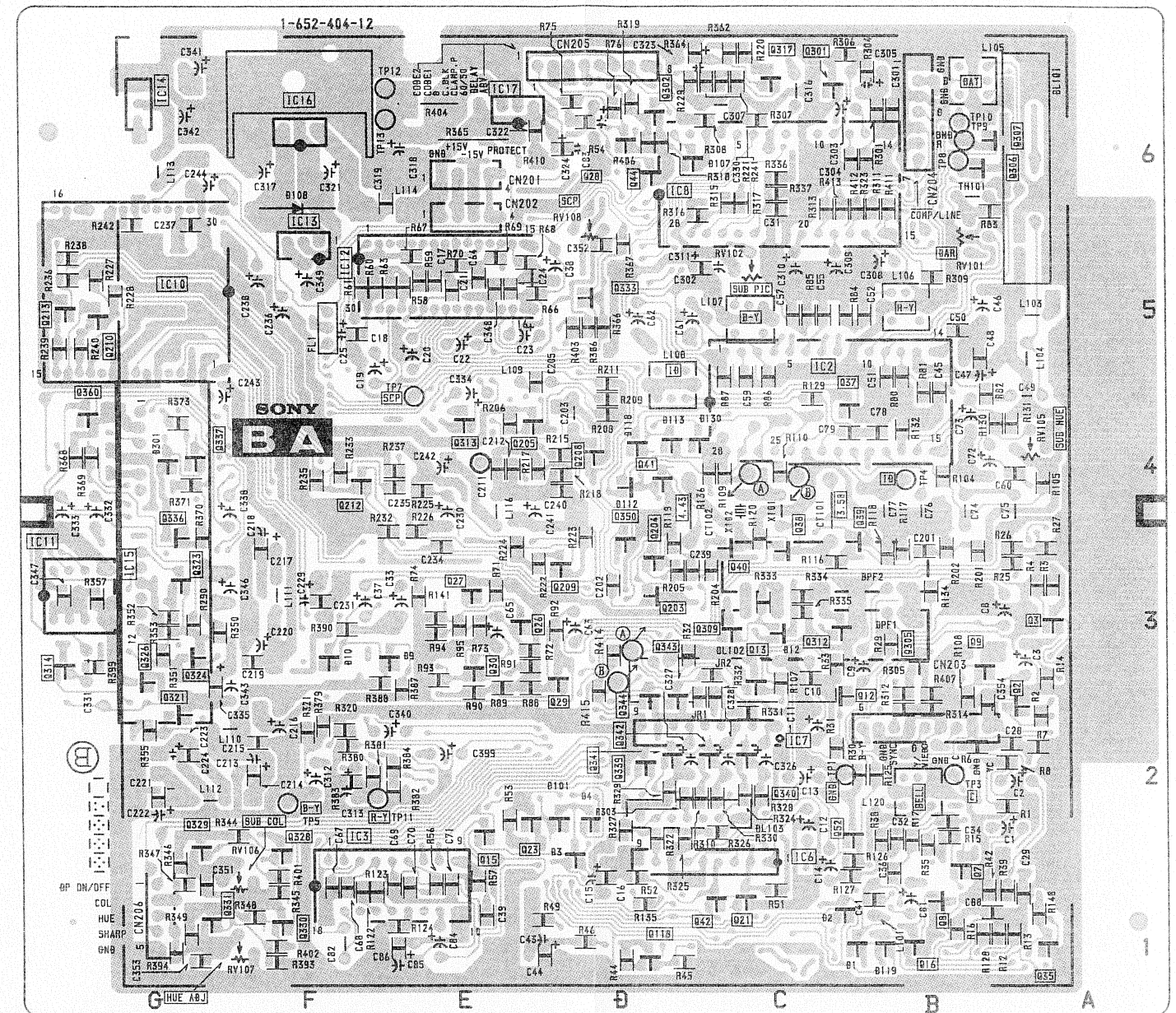
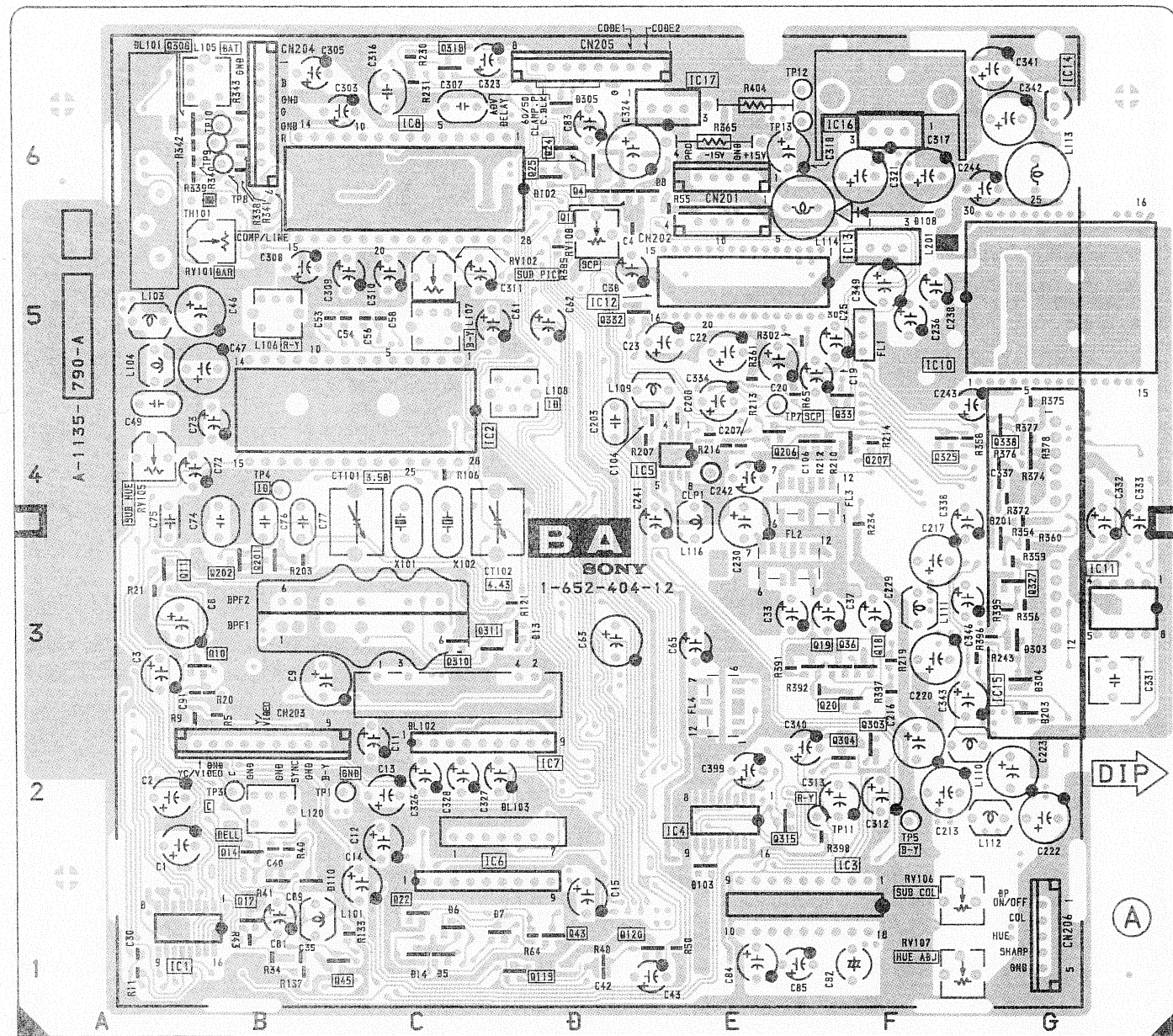
Ref. No.	OPERATION	Ref. No.	OPERATION
IC1	SYSTEM SW	Q301	DP SW
IC2	DECODER	Q302	BLK BUFF
IC3	TRANSIENT IMPROVE	Q303	B-Y BUFF
IC5	CLOCK GEN	Q304	R-Y BUFF
IC6	Y SW -1	Q305	SYNC BUFF
IC7	Y SW -2	Q306	R BUFF
IC8	MATRIX	Q307	G BUFF
IC10	COMB FILTER	Q308	B BUFF
IC11	50/60 DET	Q309	SYSTEM SW
IC12	SHARPNESS CONT	Q310	SYSTEM SW
IC13	9V REG	Q311	SYSTEM SW
IC14	-12V REG	Q312	SYSTEM SW
IC15	SCP GEN	Q313	Y BUFF
IC16	12V REG	Q314	Y BUFF
IC17	5V REG	Q315	COMP/LINE SW
		Q317	Y AMP
Q1	+5V PROT -1	Q318	Y AMP
Q2	YC/VIDEO SW	Q321	50/60 SW
Q3	BUFF	Q323	PHASE SW
Q4	+5V PROT -2	Q324	PHASE SW
Q7	C BUFF -1	Q325	50/60 SW
Q8	SW	Q326	VD SW
Q9	VIDEO AMP -1	Q327	Y BUFF
Q10	VIDEO AMP -2	Q328	COL BUFF
Q11	VIDEO BUFF	Q329	COL BUFF
Q12	Y BUFF -1	Q330	HUE BUFF
Q13	Y BUFF -2	Q331	HUE BUFF
Q14	C BUFF -2	Q332	SHARP BUFF
Q15	SW	Q333	SHARP BUFF
Q16	NT SW	Q336	Y BUFF
Q17	C BUFF -3	Q337	Y AMP
Q18	CLAMP	Q338	Y AMP
Q19	LIMITER -1	Q339	Y BUFF
Q20	LIMITER -2	Q340	Y BUFF
Q21	SW	Q341	Y BUFF
Q22	SW	Q342	Y BUFF
Q23	W/B SW	Q343	DELAY SW
Q24	+12V PROT -1	Q344	DELAY SW
Q25	+12V PROT -2	Q350	SW
Q26	V AMP	Q360	PHASE SW
Q27	V BUFF		
Q28	SW	D1	SYSTEM SW
Q29	V BUFF	D2	SYSTEM SW
Q30	V AMP	D3	SYSTEM SW
Q33	Y BUFF	D4	SYSTEM SW
Q35	YC/VIDEO SW	D5	SYSTEM SW
Q36	LIMITER	D6	SYSTEM SW
Q37	ID SW	D7	SYSTEM SW
Q38	NT SW	D8	PROTECTOR
Q39	CLOCK BUFF	D9	PROTECTOR
Q40	CLOCK BUFF	D10	LEVEL SHIFT
Q41	PAL SW	D12	SYSTEM SW
Q42	PAL SW	D13	SYSTEM SW
Q43	SW	D14	SYSTEM SW
Q44	CODE SW	D101	LEVEL SHIFT
Q45	SW	D102	LEVEL SHIFT
Q52	Y BUFF -3	D103	SYSTEM SW
Q118	Y BUFF -2	D107	OR
Q119	Y AMP	D108	PROTECTOR
Q120	Y AMP	D110	SECAM LIMITEF
Q201	PAL SW	D112	SYSTEM SW
Q202	CLOCK BUFF	D113	SYSTEM SW
Q203	CLOCK BUFF	D118	SYSTEM SW
Q204	NTSC SW	D119	SYSTEM SW
Q205	CLOCK AMP	D130	SYSTEM SW
Q206	CLOCK AMP	D201	CLAMP
Q207	CLOCK BUFF	D301	LEVEL SHIFT
Q208	SW	D303	LIMITER
Q209	Y BUFF	D304	LIMITER
Q210	Y BUFF	D305	LEVEL SHIFT
Q212	C BUFF		
Q213	C BUFF		

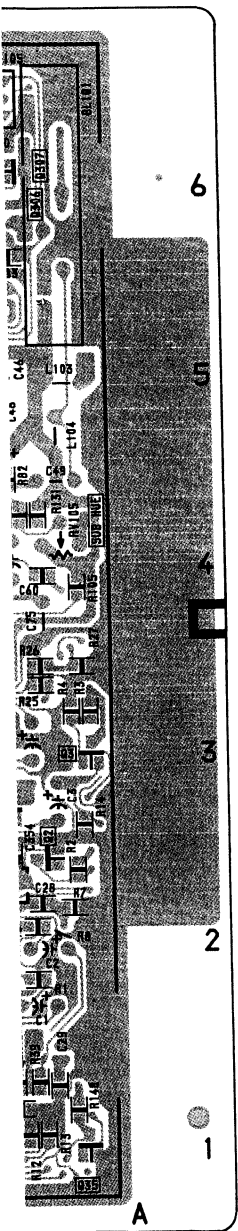
1 2 3 4 5 6 7 8 9 10 11

A
B
C
D
E
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G
H
I
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K
L
M
N
O









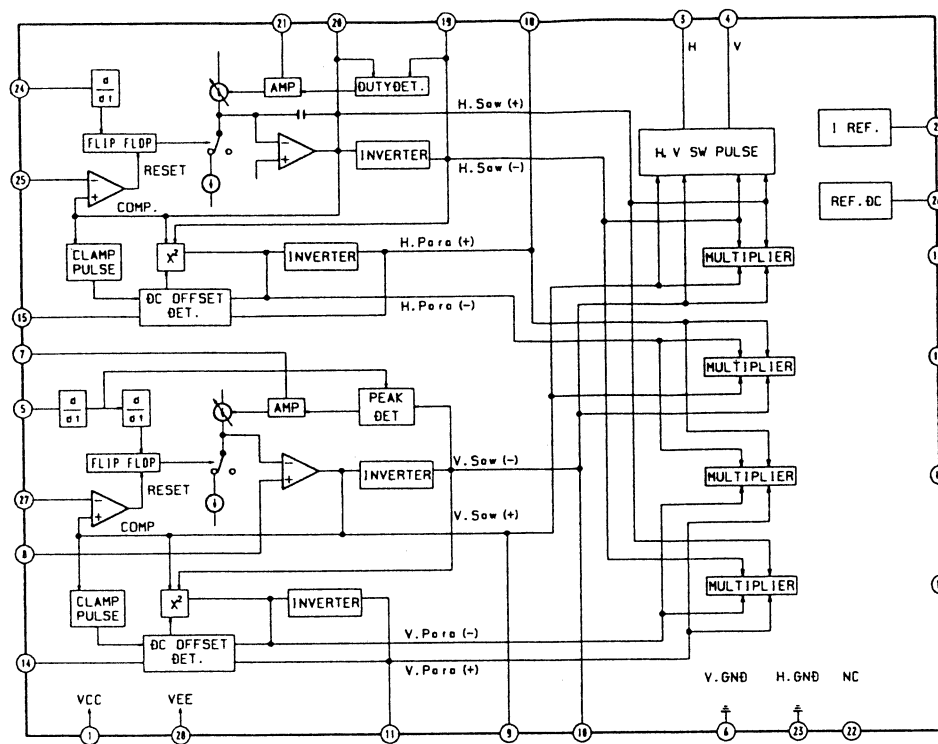
BA -B SIDE-
SUFFIX:-12

BA BOARD

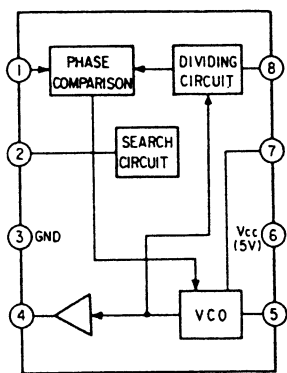
*: B SIDE

IC1	B-2	Q332	D-5
IC2	C-4	Q333	*D-5
IC3	F-1	Q336	*G-4
IC4	E-2	Q337	*G-4
IC5	E-4	Q338	G-4
IC6	D-1	Q339	*D-2
IC7	D-2	Q340	*C-2
IC8	C-6	Q341	*D-2
IC10	G-5	Q342	*C-2
IC11	G-3	Q343	*D-3
IC12	E-5	Q344	*D-3
IC13	F-5	Q350	*D-4
IC14	G-6	Q360	*G-4
IC15	G-3		
IC16	F-6		
IC17	E-6		
Q1	D-6	D1	*B-1
Q2	*A-2	D2	*B-1
Q3	*A-3	D3	*D-2
Q4	D-6	D4	*D-2
Q7	*B-1	D5	C-1
Q8	*B-1	D6	C-1
Q9	*B-3	D7	D-1
Q10	B-3	D8	D-6
Q11	A-3	D9	*E-3
Q12	*C-3	D10	*F-3
Q13	*C-3	D12	*C-3
Q14	B-2	D13	D-3
Q15	*E-2	D14	C-1
Q16	*B-1	D101	*D-2
Q17	B-1	D102	D-6
Q18	F-3	D103	E-2
Q19	F-3	D107	*C-6
Q20	F-3	D108	F-6
Q21	*C-1	D110	B-1
Q22	C-1	D112	*D-4
Q23	*E-2	D113	*D-4
Q24	D-6	D118	*D-4
Q25	D-6	D119	*B-1
Q26	*E-3	D130	*C-4
Q27	*E-3	D201	G-4
Q28	*D-6	D301	*G-4
Q29	*D-3	D303	G-3
Q30	*E-3	D304	G-3
Q33	F-4	D305	D-6
Q35	*A-1	CT101	C-4
Q36	F-3	CT102	D-4
Q37	*B-4	RV101	B-5
Q38	*C-4	RV102	C-5
Q39	*B-4	RV105	A-4
Q40	*C-4	RV106	F-1
Q41	*D-4	RV107	F-1
Q42	*C-1	RV108	D-5
Q43	D-1	TP1	B-2
Q44	*D-6	TP3	B-2
Q45	B-1	TP4	B-4
Q52	*B-2	TP5	F-2
Q118	*D-1	TP7	E-4
Q119	D-1	TP8	B-6
Q120	D-1	TP9	B-6
Q201	B-3	TP10	B-6
Q202	B-3	TP11	F-2
Q203	*D-3	TP12	E-6
Q204	*D-3	TP13	E-6
Q205	*E-4		
Q206	E-4		
Q207	F-4		
Q208	*D-4		
Q209	*D-3		
Q210	*G-5		
Q212	*F-4		
Q213	*G-5		
Q301	*C-6		
Q302	*D-6		
Q303	F-2		
Q304	F-2		
Q305	*B-3		
Q306	*B-6		
Q307	*B-6		
Q308	B-6		
Q309	*C-3		
Q310	C-3		
Q311	D-3		
Q312	*C-3		
Q313	*E-4		
Q314	*G-3		
Q315	E-2		
Q317	*C-6		
Q318	C-6		
Q321	*G-1		
Q323	*G-3		
Q324	*G-3		
Q325	F-4		
Q326	*G-3		
Q327	G-3		
Q328	*F-2		
Q329	*G-2		
Q330	*F-1		
Q331	*G-1		

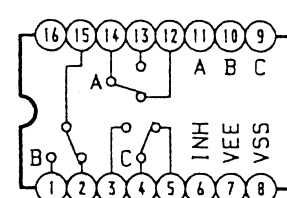
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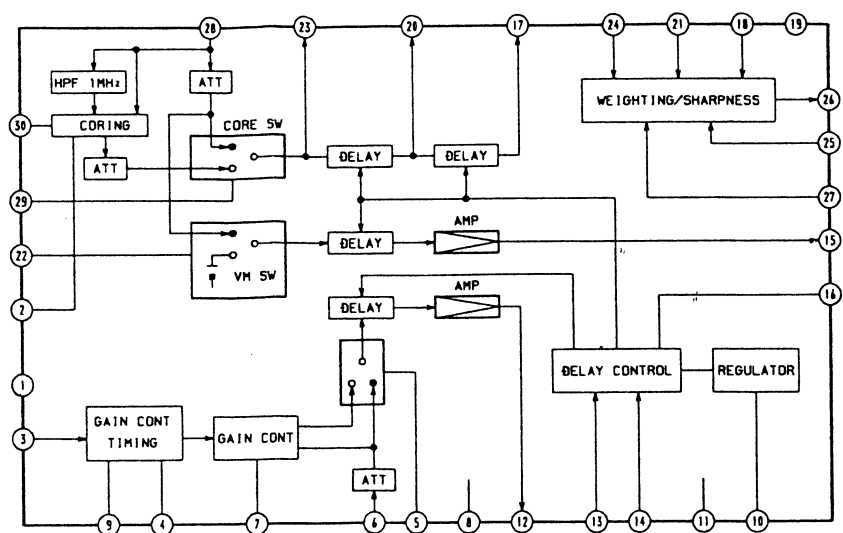
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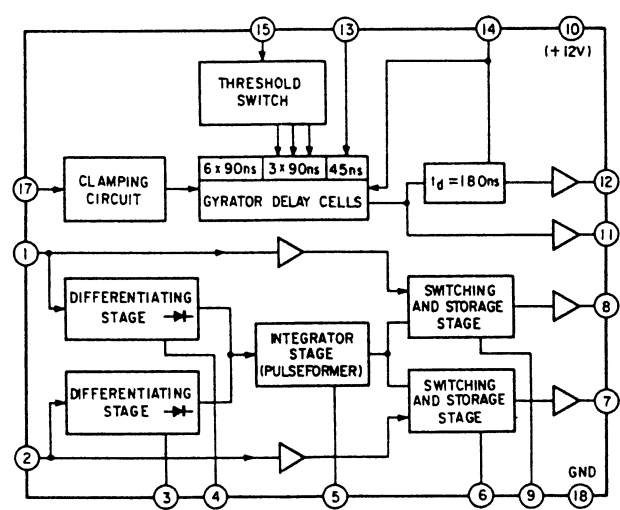
BA BOARD IC1,4 MC14053BF



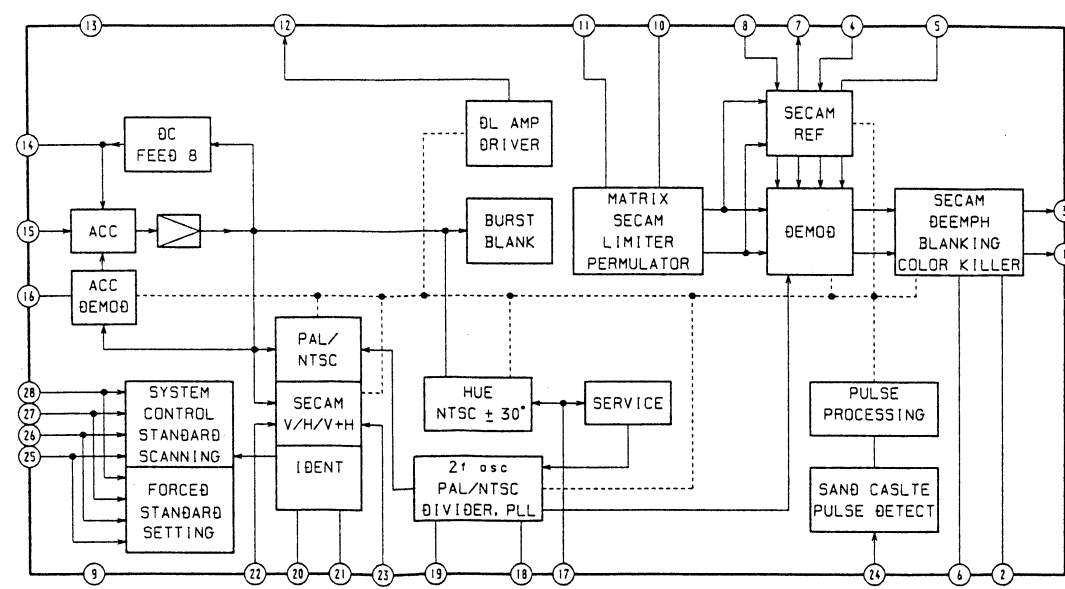
BA BOARD IC12 CXA1387S



BA BOARD IC3 TDA4565



BA BOARD IC2 TDA4555

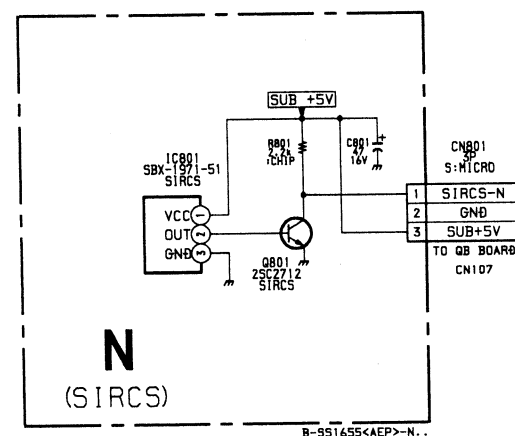
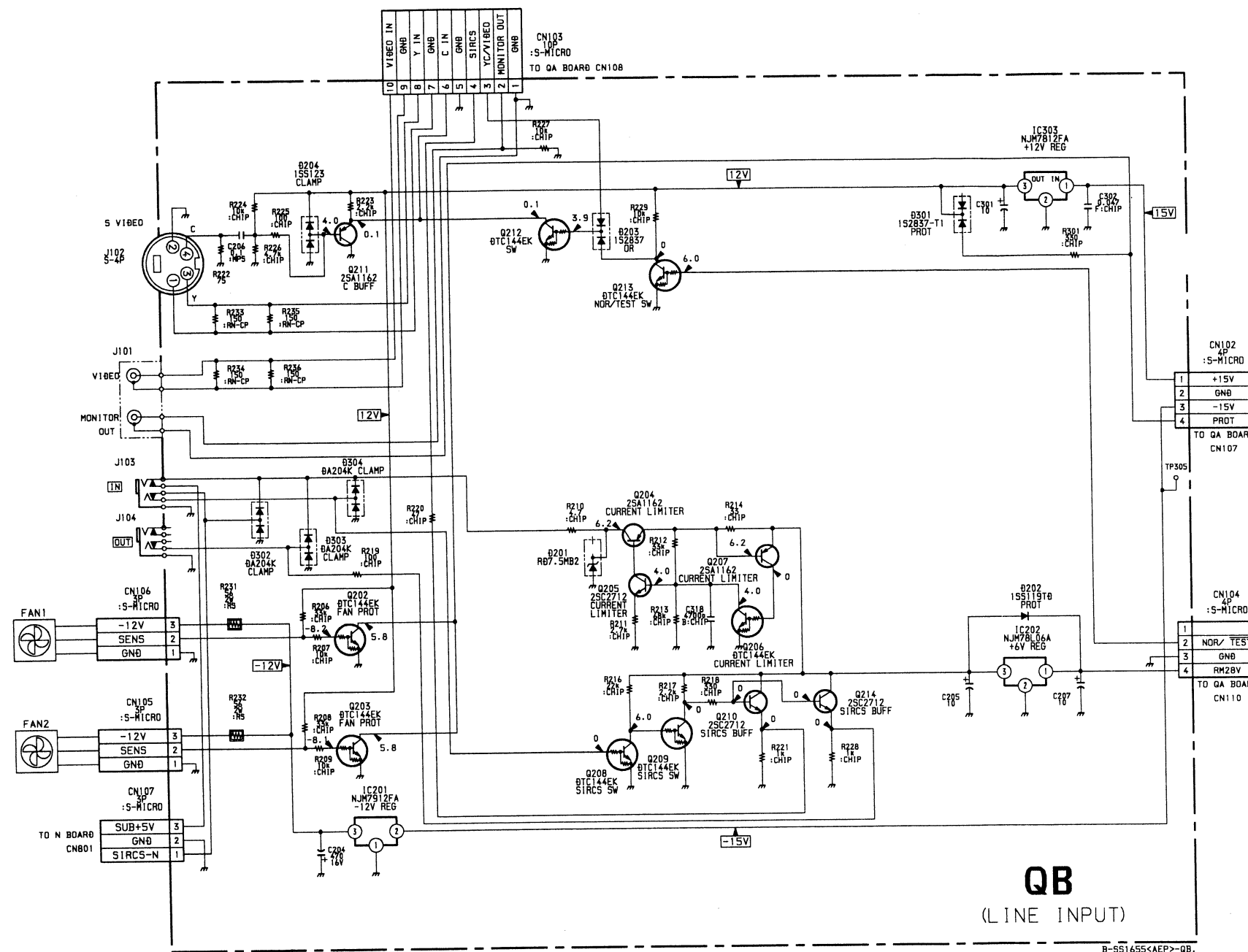


QA BOARD OPERATION

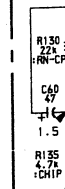
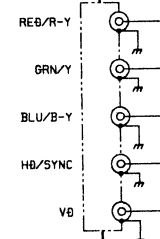
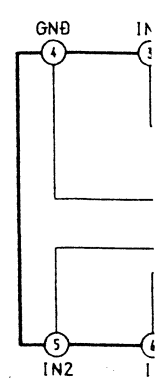
Ref. No.	OPERATION	Ref. No.	OPERATION
IC1	SYNC MIX	Q27	TEST BUFF
IC2	MODE CONT	Q28	Y BUFF
IC3	SW	Q29	YC/VIDEO SW
IC4	COMP SW	Q30	YC/VIDEO SW
IC6	TEST SIG. GEN	Q40	SW
IC7	+5V REG	Q41	R-Y AMP
IC8	+8V REG	Q42	R-Y BUFF
IC9	+12V REG	Q43	R-Y BUFF
IC10	+12V REG	Q44	B-Y AMP
		Q45	B-Y BUFF
Q1	R BUFF	Q46	B-Y BUFF
Q2	R OUT	Q47	SW
Q3	G BUFF		
Q4	G OUT	D1	LIMIT
Q5	B BUFF	D2	LIMIT
Q6	B OUT	D3	LIMIT
Q7	LIMIT BUFF	D4	LIMIT
Q8	RGB BLK	D5	HD CLAMP
Q9	CLAMP BUFF	D6	VD CLAMP
Q10	YC/VIDEO SW	D7	SYNC DISCRI
Q11	C BUFF	D8	Y PROT
Q12	SYNC AMP	D9	TEST SW
Q13	SYNC AMP	D10	SW
Q14	SYNC BUFF	D11	PROT.
Q15	NOR/TEST SW	D12	OR
Q16	Y BUFF	D13	PROT
Q17	VIDEO AMP	D14	PROT
Q18	VIDEO BUFF	D15	STARTER
Q19	SW	D16	LEVEL SIHFT
Q20	SW	D17	PROT
Q21	POWER SW	D18	POWER
Q22	POWER SW	D19	POWER
Q23	PROTECTOR	D20	VIDEO PROT
Q24	PROTECTOR	D21	R CLAMP
Q25	VIDEO BUFF	D22	G CLAMP
Q26	VIDEO BUFF	D23	B CLAMP

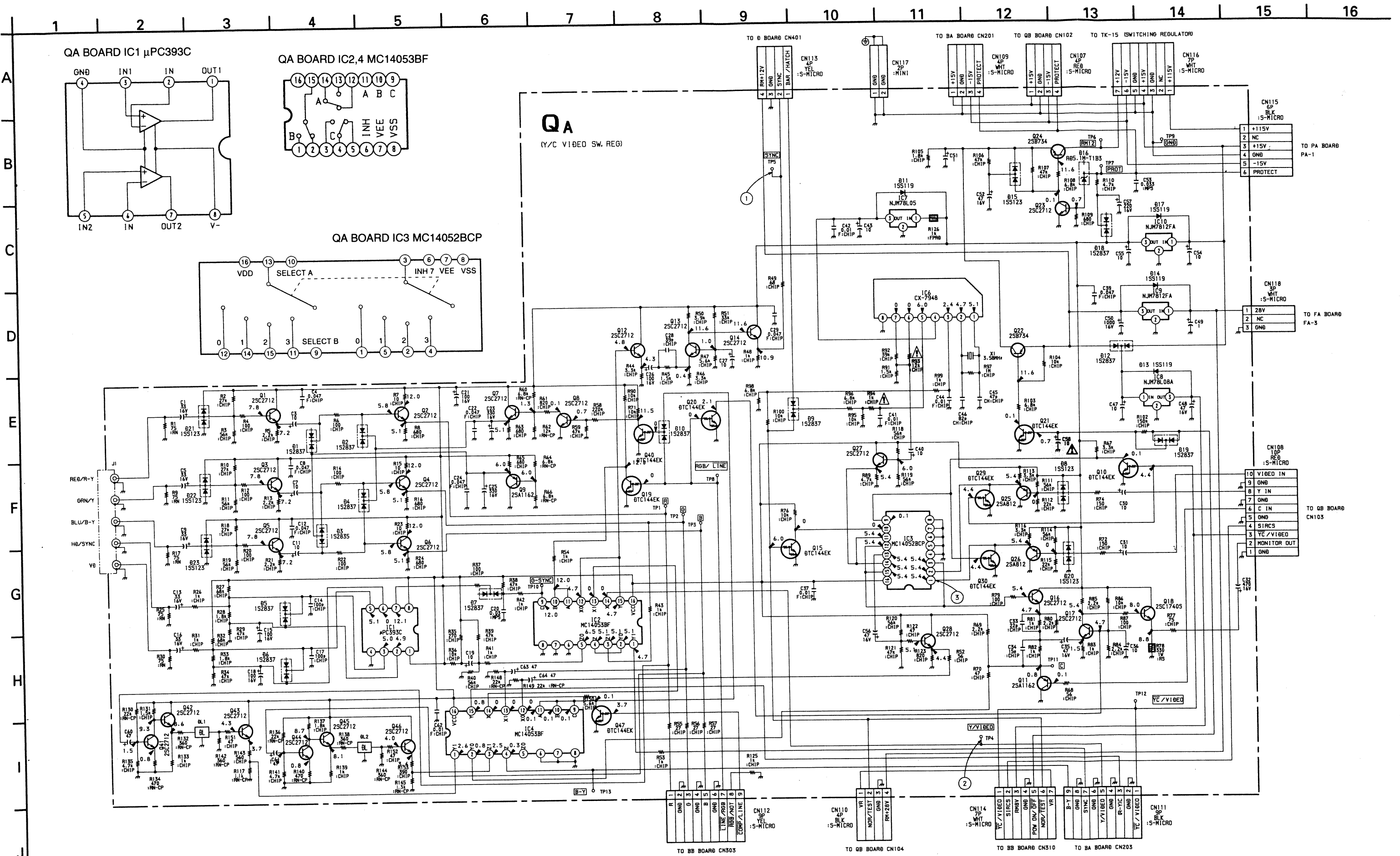
QA BOARD WAVEFORMS

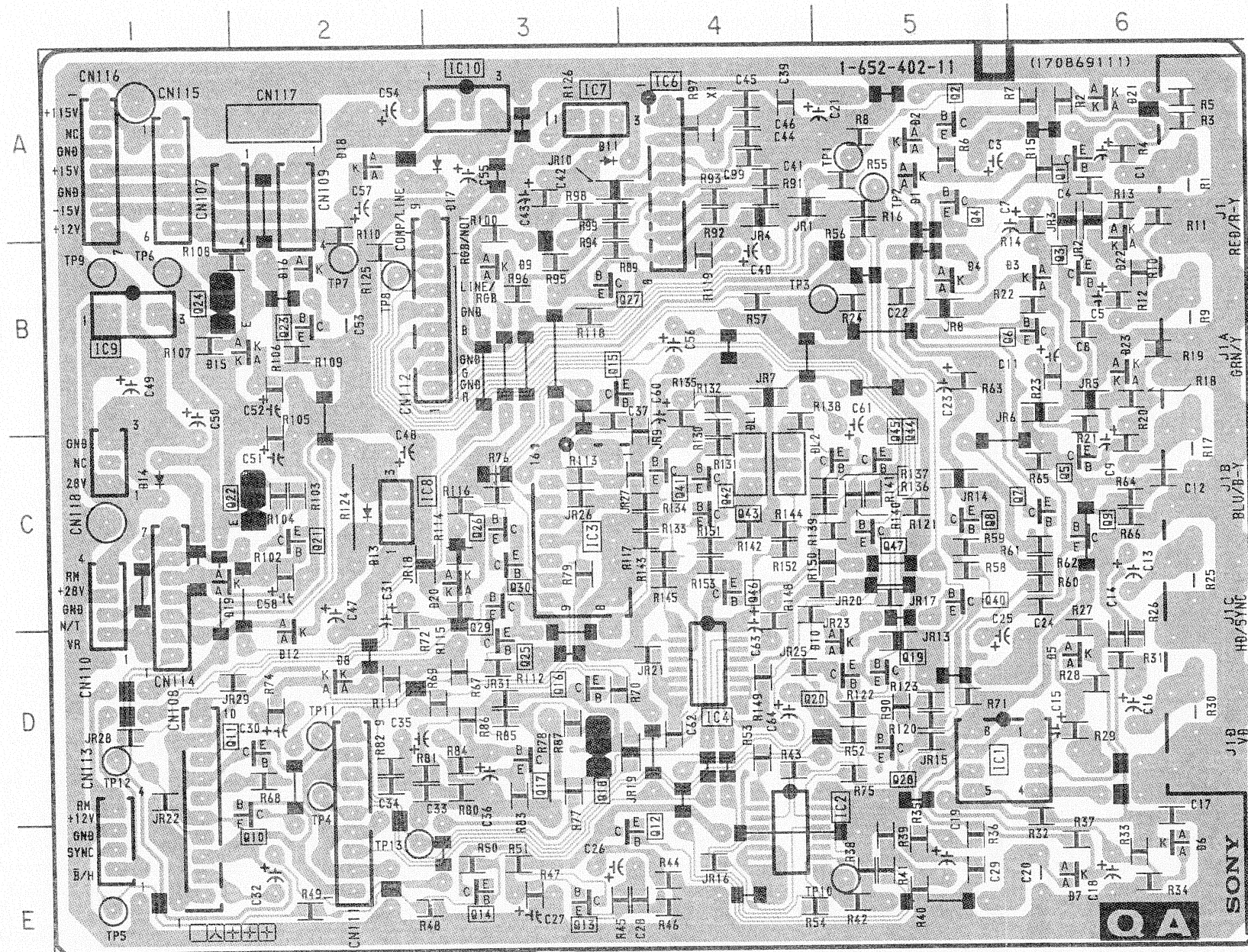
① PAL 4.0 Vp-p (H)	① SECAM 1.0 Vp-p (H)	① NTSC3.58 1.9 Vp-p (H)
① NTSC4.43 3.8 Vp-p (H)	② PAL 1.0 Vp-p (H)	② SECAM 0.9 Vp-p (H)
② NTSC3.58 1.0 Vp-p (H)	② NTSC4.43 1.1 Vp-p (H)	③ PAL 1.1 Vp-p (H)
③ SECAM 1.0 Vp-p (H)	③ NTSC3.58 1.1 Vp-p (H)	③ NTSC4.43 1.1 Vp-p (H)



QA BOARD I



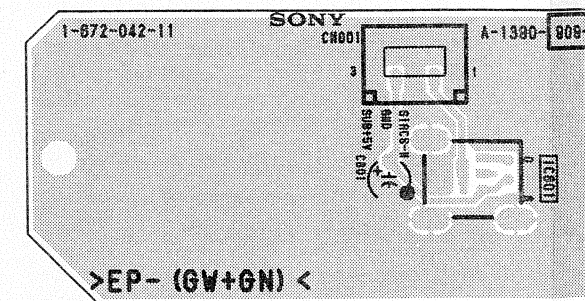
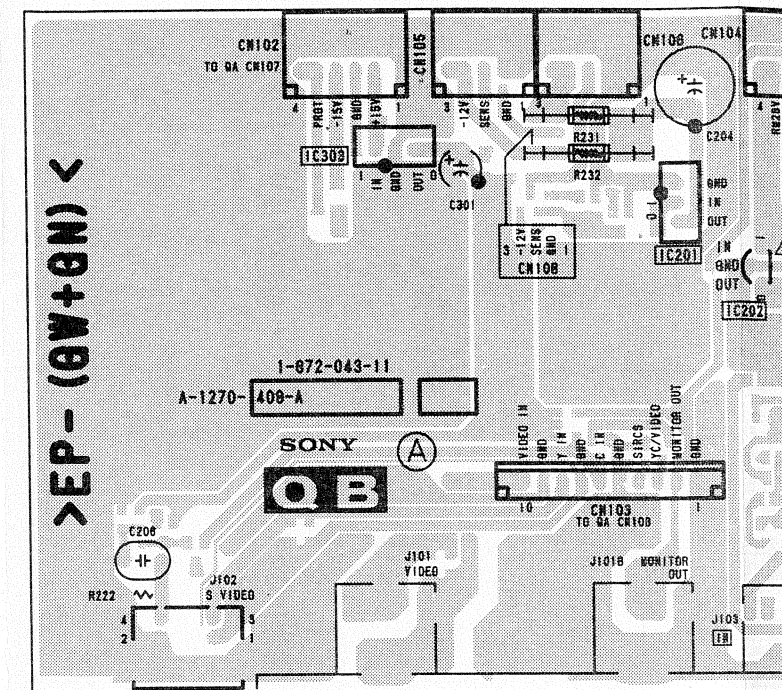


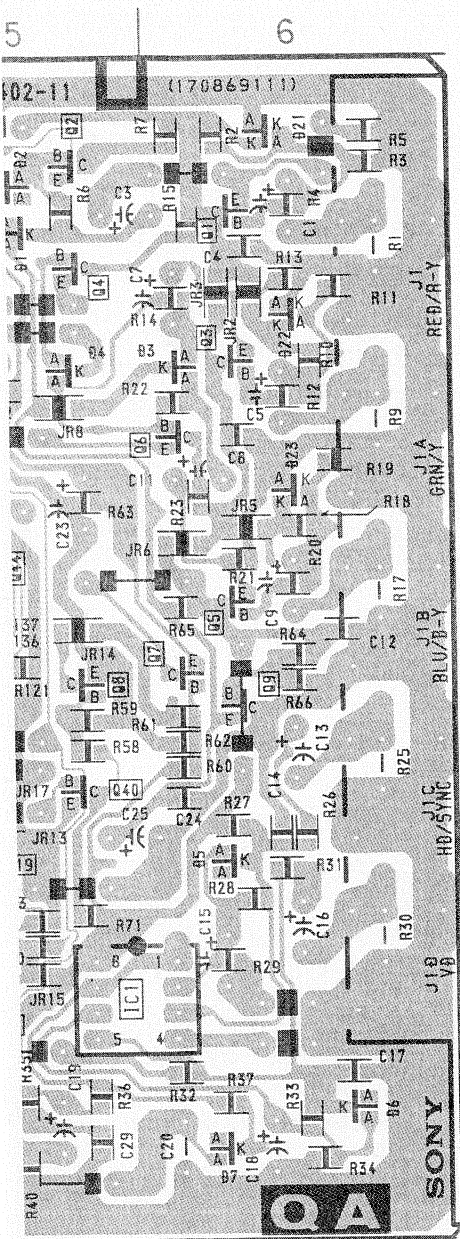


QA
SUFFIX:-11

QA BOARD

IC1	D-5
IC2	E-4
IC3	C-3
IC4	D-4
IC6	A-4
IC7	A-3
IC8	C-2
IC9	B-1
IC10	A-3
Q1	A-6
Q2	A-5
Q3	B-6
Q4	A-5
Q5	C-6
Q6	B-6
Q7	C-6
Q8	C-5
Q9	C-6
Q10	D-2
Q11	D-2
Q12	B-3
Q13	B-3
Q14	B-3
Q15	B-3
Q16	D-3
Q17	D-3
Q18	D-3
Q19	D-5
Q20	D-5
Q21	C-2
Q22	C-1
Q23	B-2
Q24	B-1
Q25	D-3
Q26	C-3
Q27	D-5
Q28	C-3
Q29	C-3
Q30	C-3
Q40	C-5
Q41	C-4
Q42	C-4
Q43	C-4
Q44	C-5
Q45	C-5
Q46	C-4
Q47	C-5
D1	A-5
D2	A-5
D3	B-6
D4	B-5
D5	D-6
D6	E-6
D7	E-6
D8	D-2
D9	B-3
D10	D-4
D11	A-3
D12	D-2
D13	C-2
D14	C-1
D15	B-2
D16	B-2
D17	A-3
D18	A-2
D19	C-1
D20	C-2
D21	A-6
D22	B-6
D23	B-6
TP1	A-5
TP2	A-5
TP3	B-4
TP4	D-2
TP5	E-1
TP6	B-1
TP7	B-2
TP8	E-2
TP9	B-1
TP10	E-4
TP11	D-2
TP13	E-2





QA
SUFFIX:-11

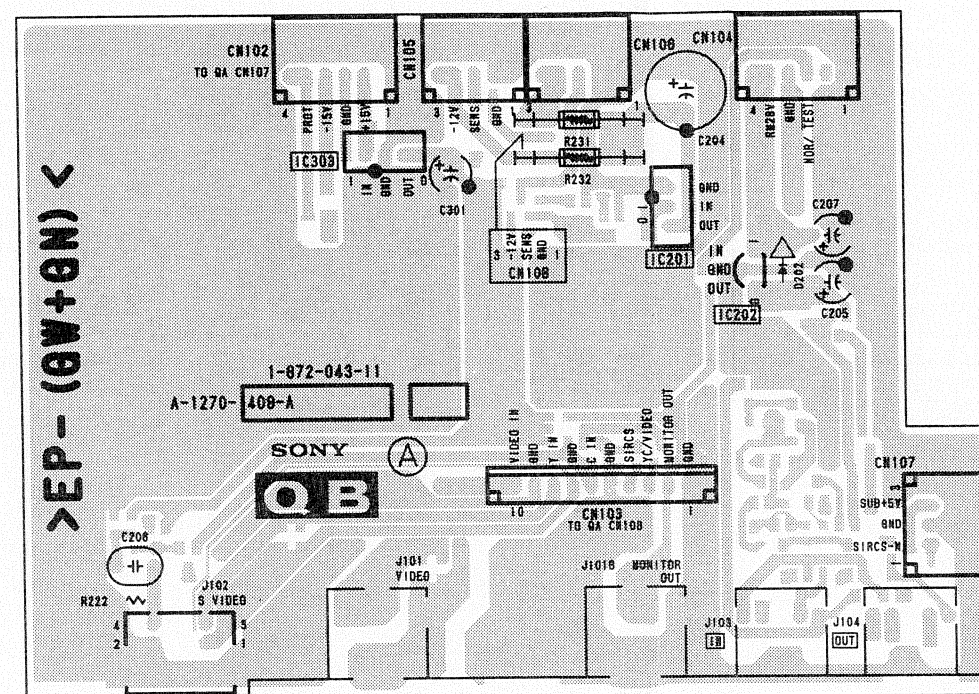
QA BOARD

IC1 D-5
IC2 E-4
IC3 C-3
IC4 D-4
IC6 A-4
IC7 A-3
IC8 C-2
IC9 B-1
IC10 A-3

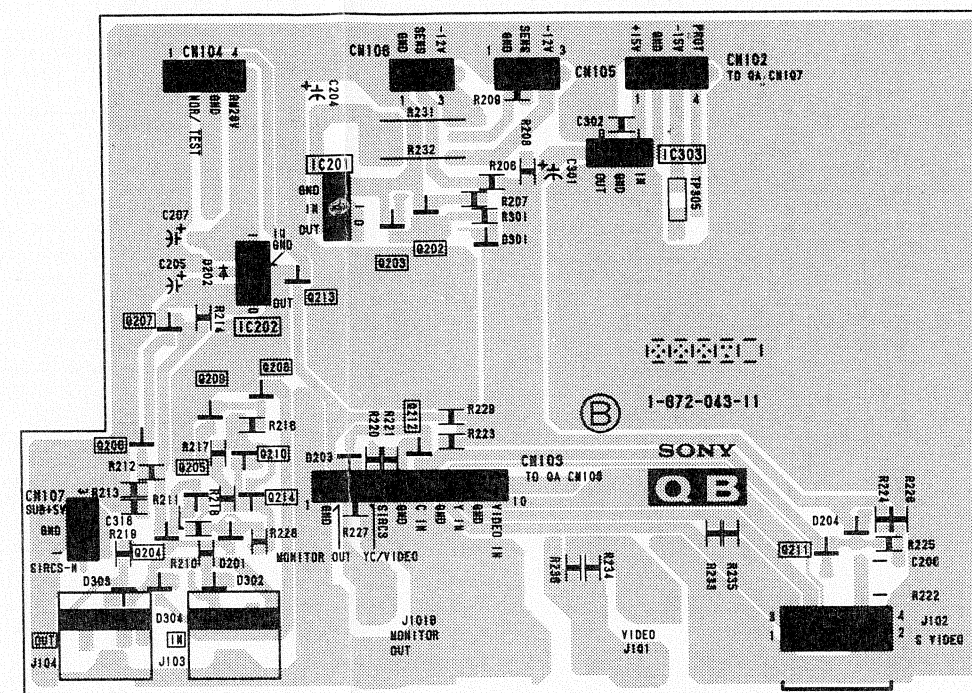
Q1 A-6
Q2 A-5
Q3 B-6
Q4 A-5
Q5 C-6
Q6 B-6
Q7 C-6
Q8 C-5
Q9 C-6
Q10 D-2
Q11 D-2
Q12 E-3
Q13 E-3
Q14 E-3
Q15 B-3
Q16 D-3
Q17 D-3
Q18 D-3
Q19 D-5
Q20 D-5
Q21 C-2
Q22 C-1
Q23 B-2
Q24 B-1
Q25 D-3
Q26 C-3
Q27 B-3
Q28 D-5
Q29 C-3
Q30 C-3
Q40 C-5
Q41 C-4
Q42 C-4
Q43 C-4
Q44 C-5
Q45 C-5
Q46 C-4
Q47 C-5

D1 A-5
D2 A-5
D3 B-6
D4 B-5
D5 D-6
D6 E-6
D7 E-6
D8 D-2
D9 B-3
D10 D-4
D11 A-3
D12 D-2
D13 C-2
D14 C-1
D15 B-2
D16 B-2
D17 A-3
D18 A-2
D19 C-1
D20 C-2
D21 A-6
D22 B-6
D23 B-6

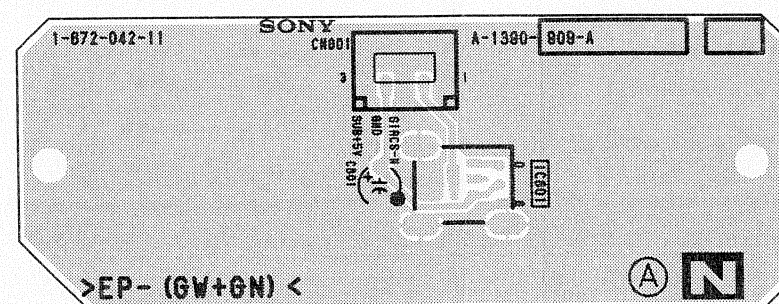
TP1 A-5
TP2 A-5
TP3 B-4
TP4 D-2
TP5 E-1
TP6 B-1
TP7 B-2
TP8 B-2
TP9 B-1
TP10 E-4
TP11 D-2
TP13 E-2



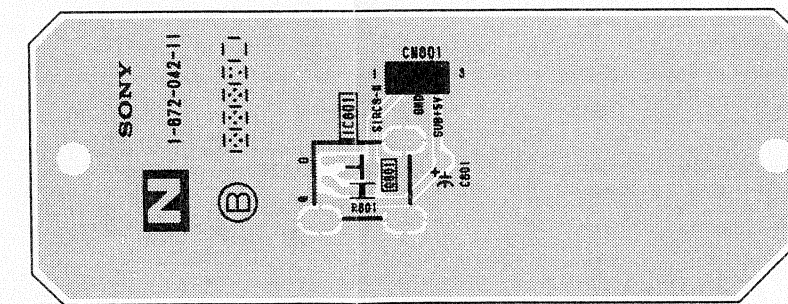
QB -A SIDE-
SUFFIX:-11



QB -B SIDE-
SUFFIX:-11



N -A SIDE-
SUFFIX:-11

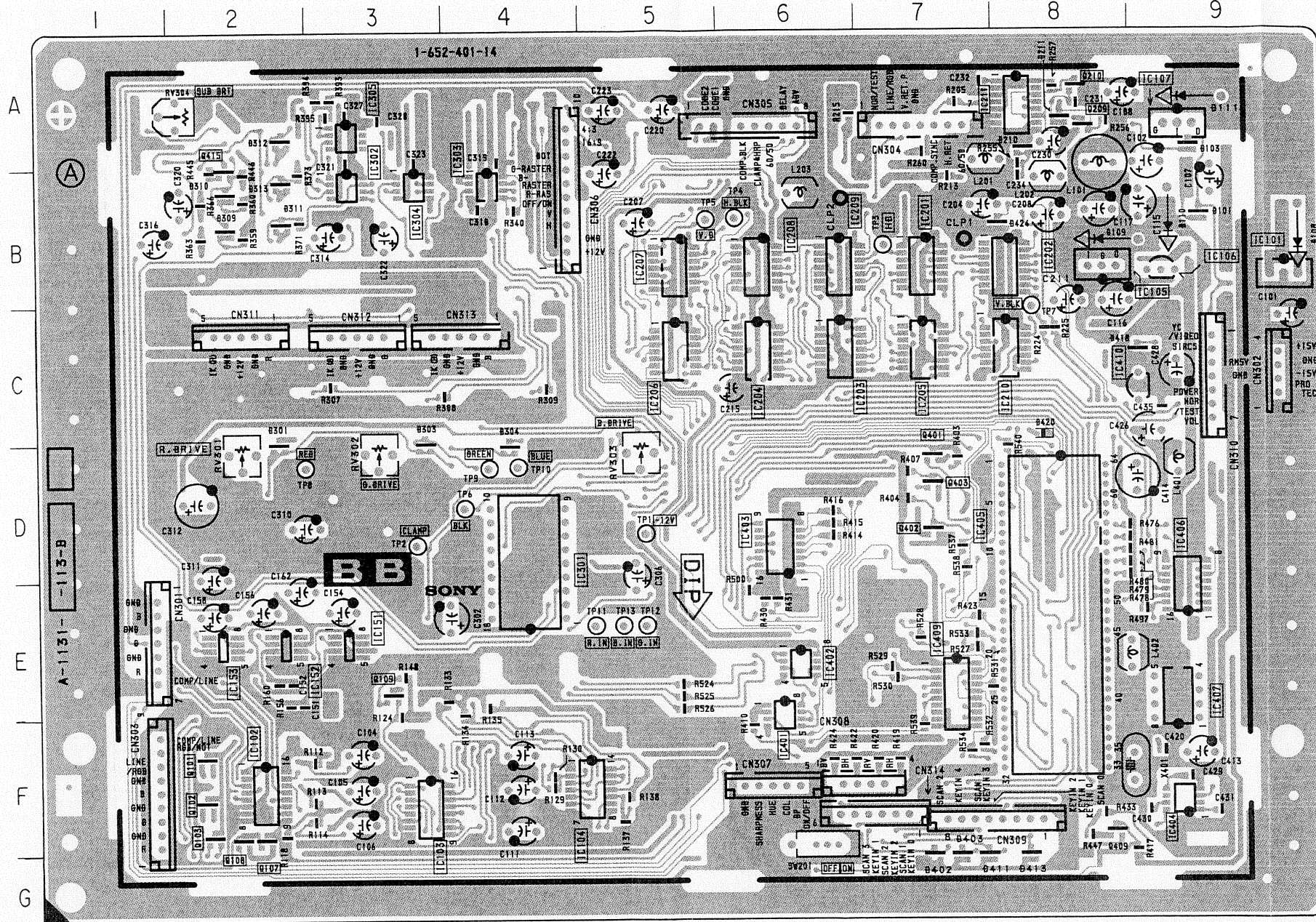
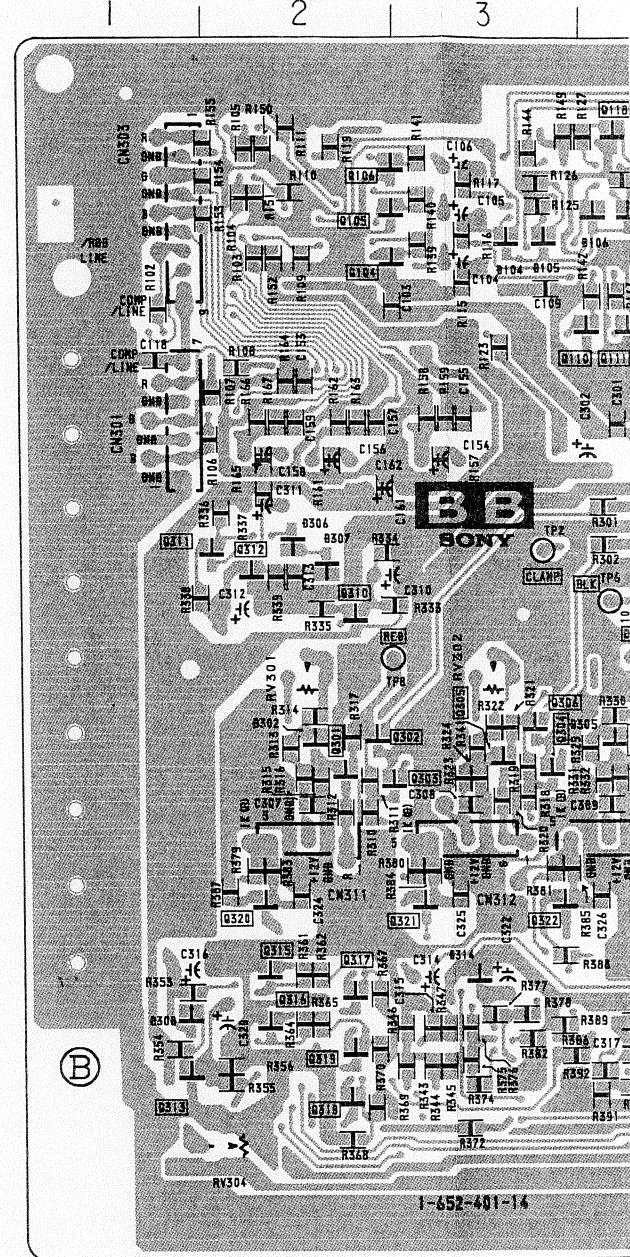


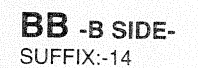
N -B SIDE-
SUFFIX:-11

BB BOARD

*: B SIDE

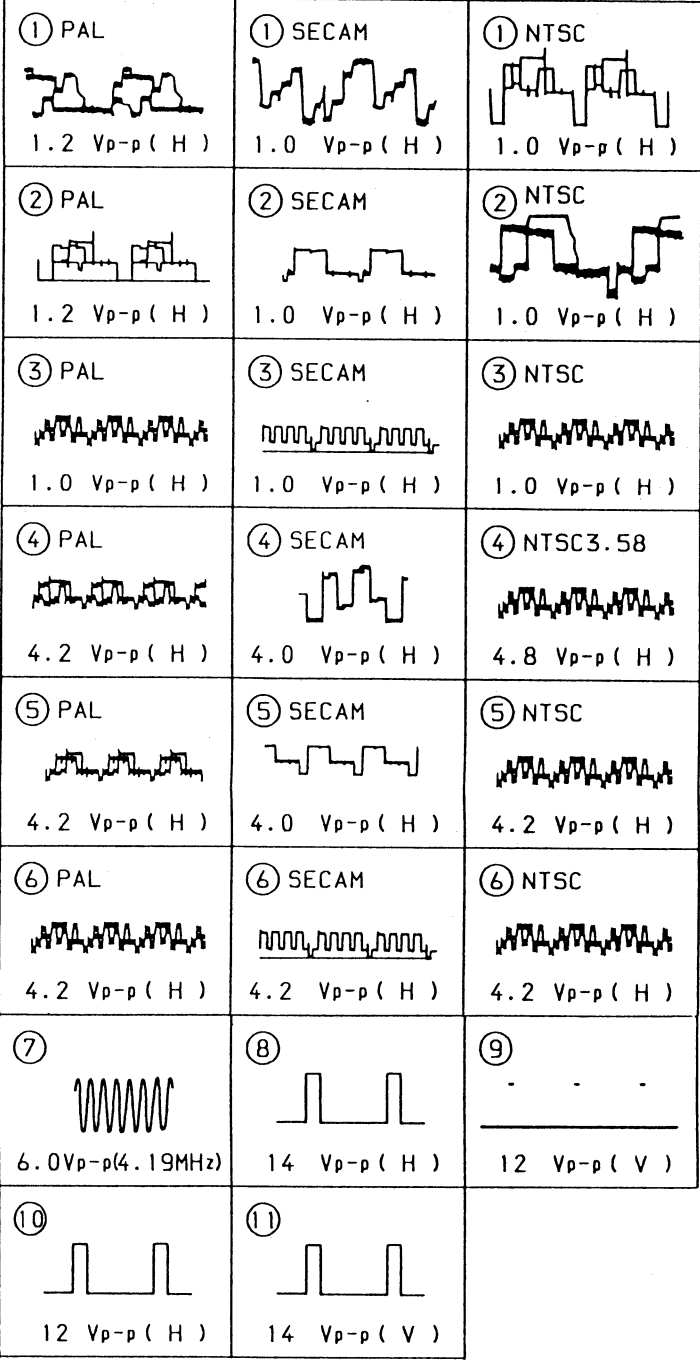
IC101	B-9	Q413	*E-7
IC102	F-2	Q414	*E-2
IC103	F-3	Q415	B-2
IC104	F-4		
IC105	B-8	D101	B-9
IC106	B-9	D103	A-9
IC107	A-9	D104	*F-3
IC151	E-3	D105	*F-3
IC152	E-2	D106	*F-4
IC153	E-2	D107	*F-4
IC201	B-7	D108	B-9
IC202	B-8	D109	B-8
IC203	C-6	D110	B-9
IC204	C-6	D111	A-9
IC205	C-7	D201	*A-6
IC206	C-5	D203	*B-7
IC207	B-5	D204	*B-6
IC208	B-6	D205	*B-7
IC209	B-6	D206	*C-5
IC210	C-8	D207	*B-5
IC211	A-8	D208	*B-7
IC301	D-4	D209	*A-5
IC302	B-3	D210	A-8
IC303	B-4	D211	A-8
IC304	B-3	D301	C-2
IC305	A-3	D302	*C-2
IC401	F-6	D303	C-3
IC402	E-6	D304	C-4
IC403	D-6	D305	*C-3
IC404	F-9	D306	*D-2
IC405	D-8	D307	*D-2
IC406	D-9	D308	*B-1
IC407	E-9	D309	B-2
IC409	E-7	D310	B-2
IC410	C-8	D311	B-2
		D312	A-2
		D313	B-2
Q101	F-2	D314	*B-3
Q102	F-2	D401	*F-8
Q103	F-2	D402	G-7
Q104	*F-2	D403	G-7
Q105	*F-2	D404	*G-8
Q106	*F-2	D405	*G-8
Q107	F-2	D406	*F-8
Q108	F-2	D407	*F-8
Q109	E-3	D408	*F-8
Q110	*E-4	D409	*G-7
Q111	*E-4	D410	*G-7
Q112	*E-4	D411	*G-7
Q113	*F-5	D412	*G-8
Q114	*F-4	D413	*G-8
Q115	*F-4	D414	*E-8
Q116	*E-4	D415	*D-9
Q117	*A-8	D418	C-9
Q118	*G-4	D419	*D-8
Q119	*G-4	D420	C-8
Q120	*F-4	D421	C-8
Q121	*G-4	D422	C-9
Q201	*A-7	D423	*E-7
Q202	*B-7	D424	B-8
Q204	*A-6	D425	*E-8
Q205	*C-5	D426	*E-8
Q206	*A-5	D427	*D-7
Q207	*A-5	D428	*D-7
Q208	*C-5	D429	C-8
Q209	A-8	D430	*D-7
Q210	A-8		
Q211	*A-8		
Q301	*C-2	RV301	D-2
Q302	*C-2	RV302	D-3
Q303	*C-2	RV303	D-5
Q304	*C-3	RV304	A-2
Q305	*C-3		
Q306	*C-3	TP1	D-5
Q307	*C-4	TP2	D-3
Q308	*C-4	TP3	B-7
Q309	*C-4	TP4	B-6
Q310	*D-2	TP5	B-5
Q311	*D-1	TP6	D-4
Q312	*D-2	TP7	C-8
Q313	*A-1	TP8	D-2
Q315	*B-2	TP9	D-4
Q316	*B-2	T10	D-4
Q317	*B-2	T11	E-5
Q318	*A-2	T12	E-5
Q319	*B-2	T13	E-5
Q320	*B-2		
Q321	*B-3		
Q322	*B-3		
Q401	D-7		
Q402	D-7		
Q403	D-7		
Q404	*F-7		
Q405	*F-7		
Q406	*F-6		
Q407	*F-6		
Q408	*F-9		
Q409	F-8		
Q410	*D-8		
Q411	*D-8		
Q412	*E-8		

BB -A SIDE-
SUFFIX:-14

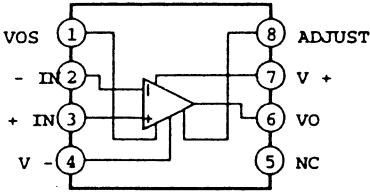




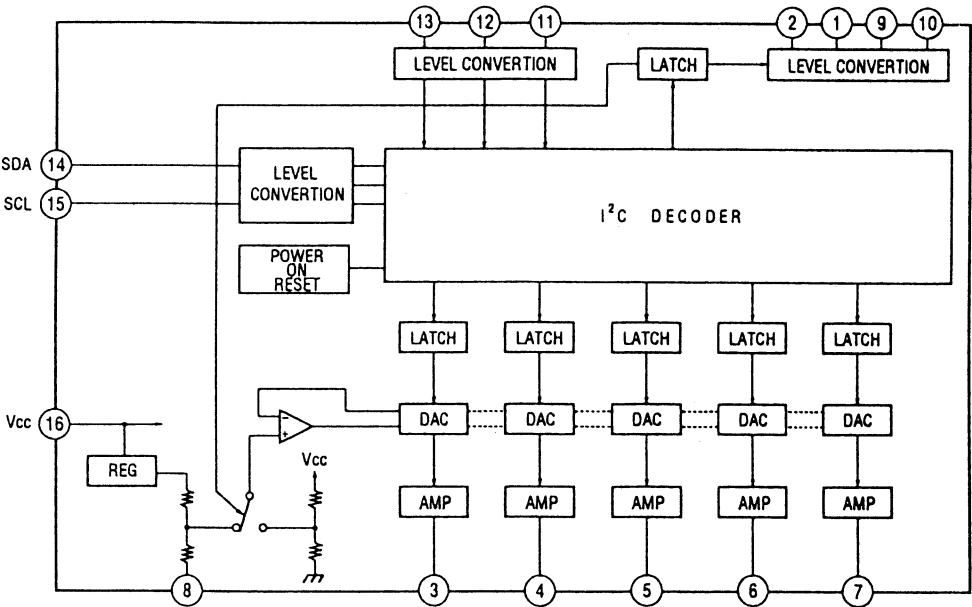
BB BOARD WAVEFORMS



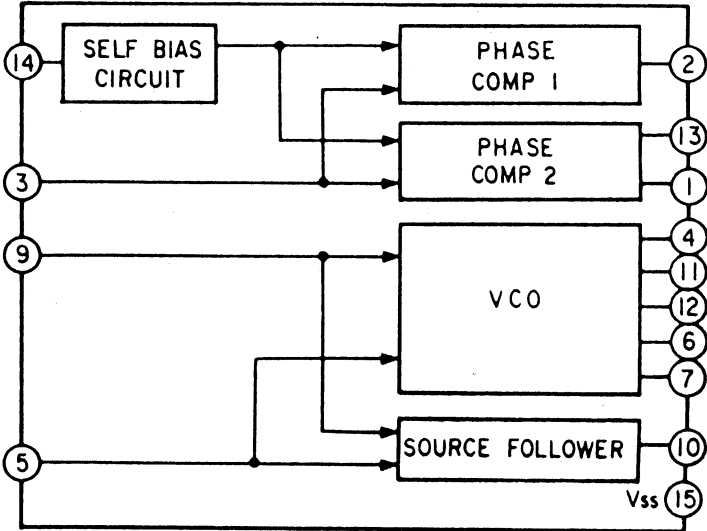
BB BOARD IC151,152,153 LM6361M



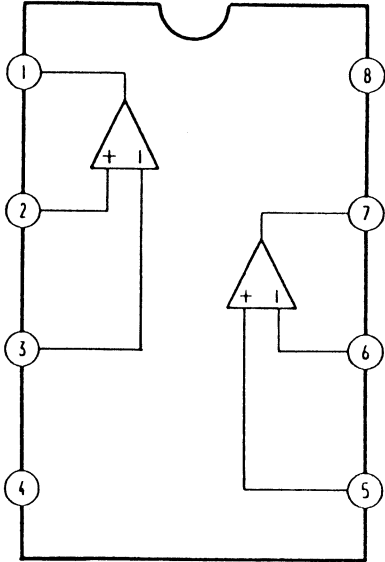
BB BOARD IC403,406 CXA1315M



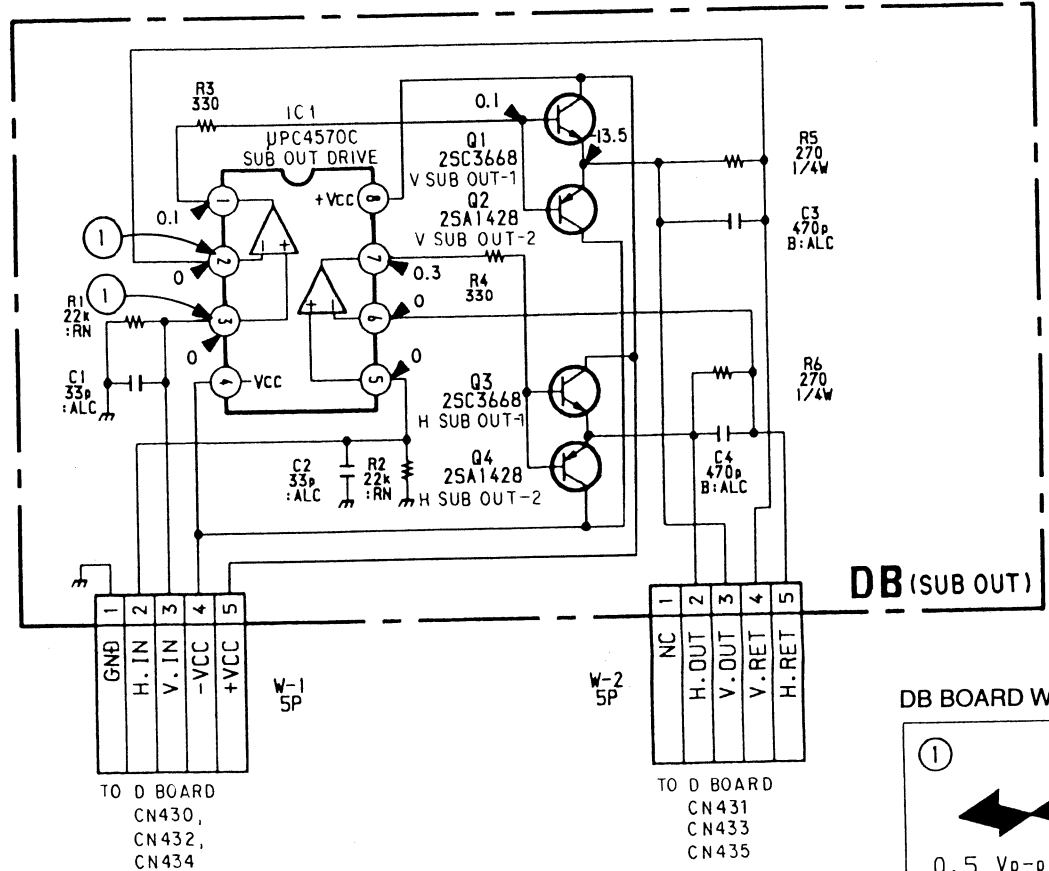
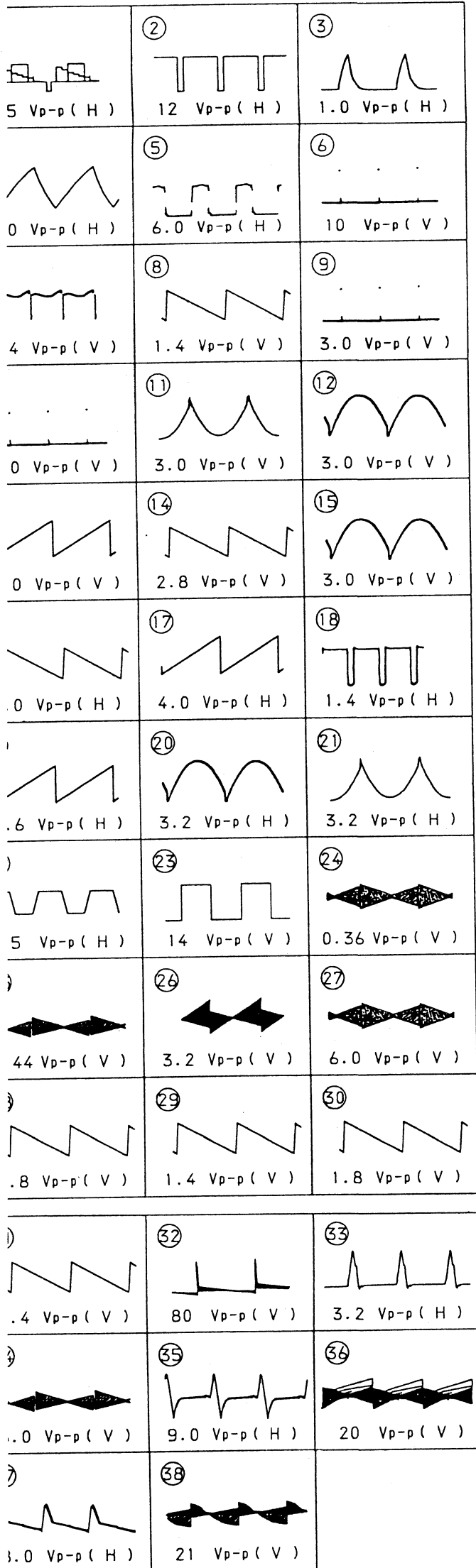
BB BOARD IC202,204 MC14046BF



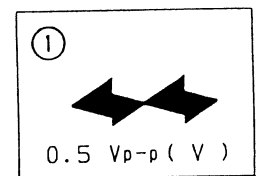
BB BOARD IC302-305,401,402 μPC4558G2



ARD WAVEFORMS



DB BOARD WAVEFORM



D BOARD OPERATION

Ref. No.	OPERATION	Ref. No.	OPERATION
IC1	H · V OSC	Q17	V · BLK ADD
IC2	SIG GEN	Q18	-12V PROT
IC3	MODE SW	Q19	V · OUT PROT -1
IC4	+12V REG	Q20	V · OUT PROT -2
IC5	-12V REG	Q21	V · POLARITY SW
IC6	12V REG (H)	Q22	V · POLARITY SW
IC7	12V REG (V)	Q23	16 : 9 V · CENT SW
IC8	HALF H · V	Q24	V · PARA BUFF
IC9	TILT BUFF	Q25	16 : 9 V · LIN SW
IC10	TILT SW	Q26	16 : 9 V · SIZE SW
IC11	H LIN BUFF	Q27	ST LED DRIVE
IC12	V KEYS BUFF	Q28	LED SW
IC13	V · PIN AMP	Q30	V · LIN BUFF
IC14	V · PIN GEN	Q31	V · PARA SW
IC15	KEYS GEN		
IC16	+8V REG	D1	PROTECT
IC17	-8V REG	D2	H · PULSE CLIP
IC18	V AMP MAIN	D3	SPEED UP
IC19	V AMP R/B	D4	TEST H · CENT
IC20	-12V REG	D6	H · OSC · LIMIT
IC21	V · SAW AMP	D7	VD -SW
IC22	LEVEL SHIFT (B)	D8	HALF V -SW
IC23	LEVEL SHIFT (R)	D9	HALF H -SW
		D10	V · BIAS (G)
Q1	SYNC BUFF	D11	V · BIAS (R)
Q2	H · PULSE AMP	D12	V · BIAS (B)
Q3	H · PULSE BUFF	D13	SW · PROT -13
Q4	V · SAW -1	D14	V · OUT PROT -1
Q5	V · SAW -2	D15	V · OUT PROT -2
Q6	V · SIZE 50/60 SW	D16	V · OUT PROT -3
Q7	V · DRIVE G	D17	V · OUT PROT -4
Q8	V · OUT (G) -1	D18	STOPPER
Q9	V · OUT (G) -2	D19	STOPPER
Q10	V · DRIVE -R	D20	LEVEL SHIFT
Q11	V · OUT (R) -1	D21	LEVEL SHIFT
Q12	V · OUT (R) -2	D23	PROTECTOR
Q13	V · DRIVE -B	D24	PROTECTOR
Q14	V · OUT (B) -1	D29	HOLD DOWN REG
Q15	V · OUT (B) -2		
Q16	PAL · H · CENT		

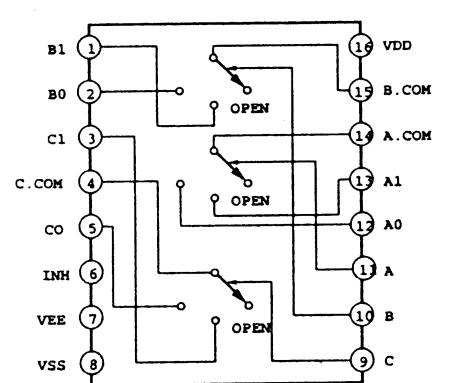
DA BOARD OPERATION

Ref. No.	OPERATION
Q1	V CLAMP
Q2	V SEP
Q3	VP SW
Q4	V BUFF

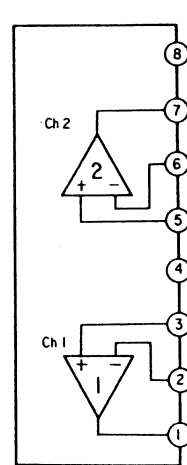
DB BOARD OPERATION

Ref. No.	OPERATION
IC1	SUB OUT DRIVE
Q1	V SUB OUT -1
Q2	V SUB OUT -2
Q3	H SUB OUT -1
Q4	H SUB OUT -2

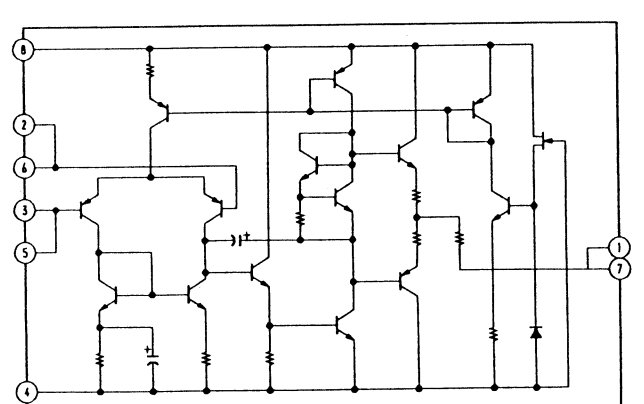
D BOARD IC3 MC14053BCP

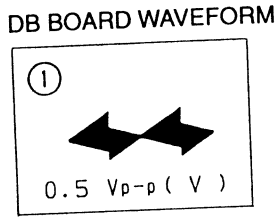
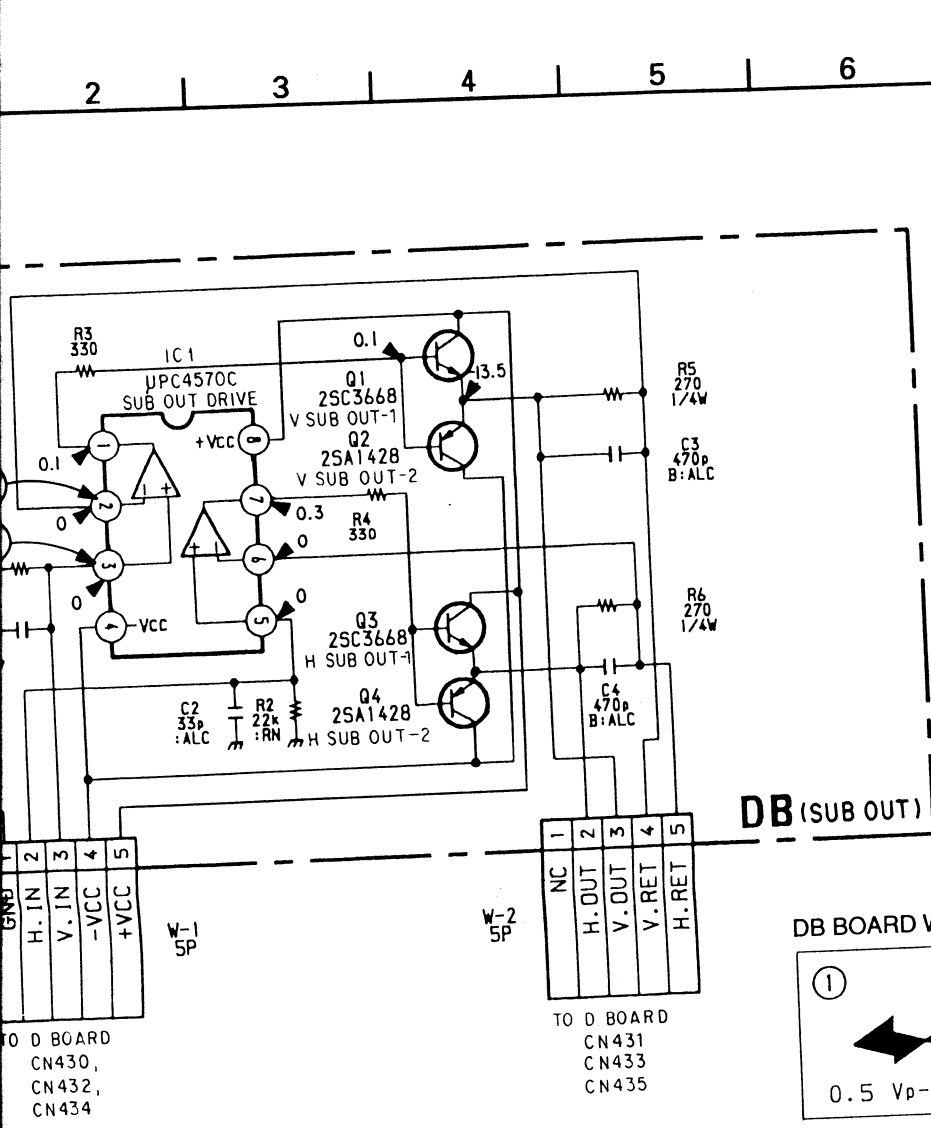


D BOARD IC8,11,12,13 M5218AL

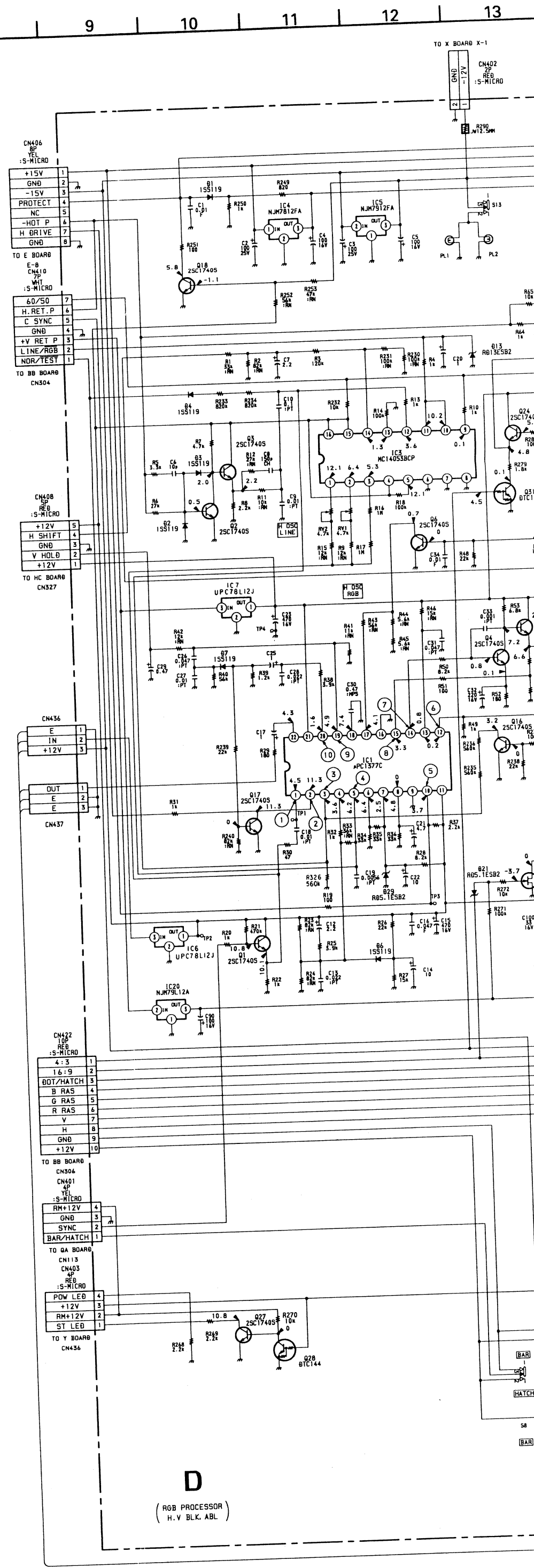
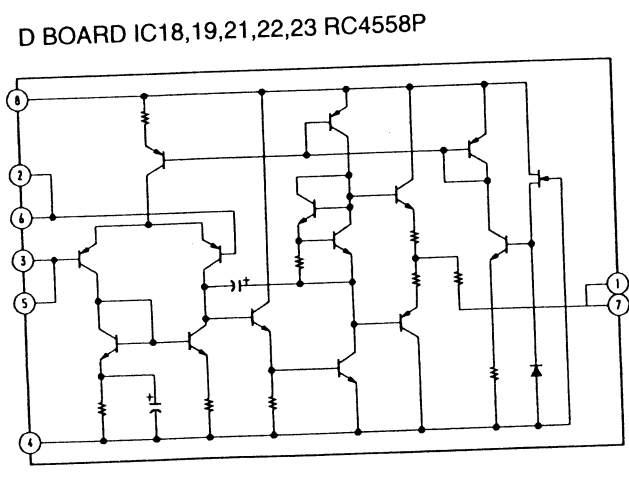
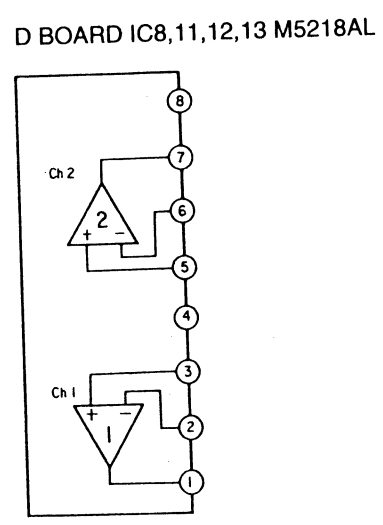
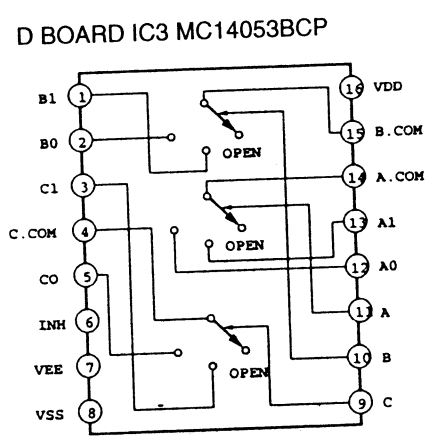


D BOARD IC18,19,21,22,23 RC4558P



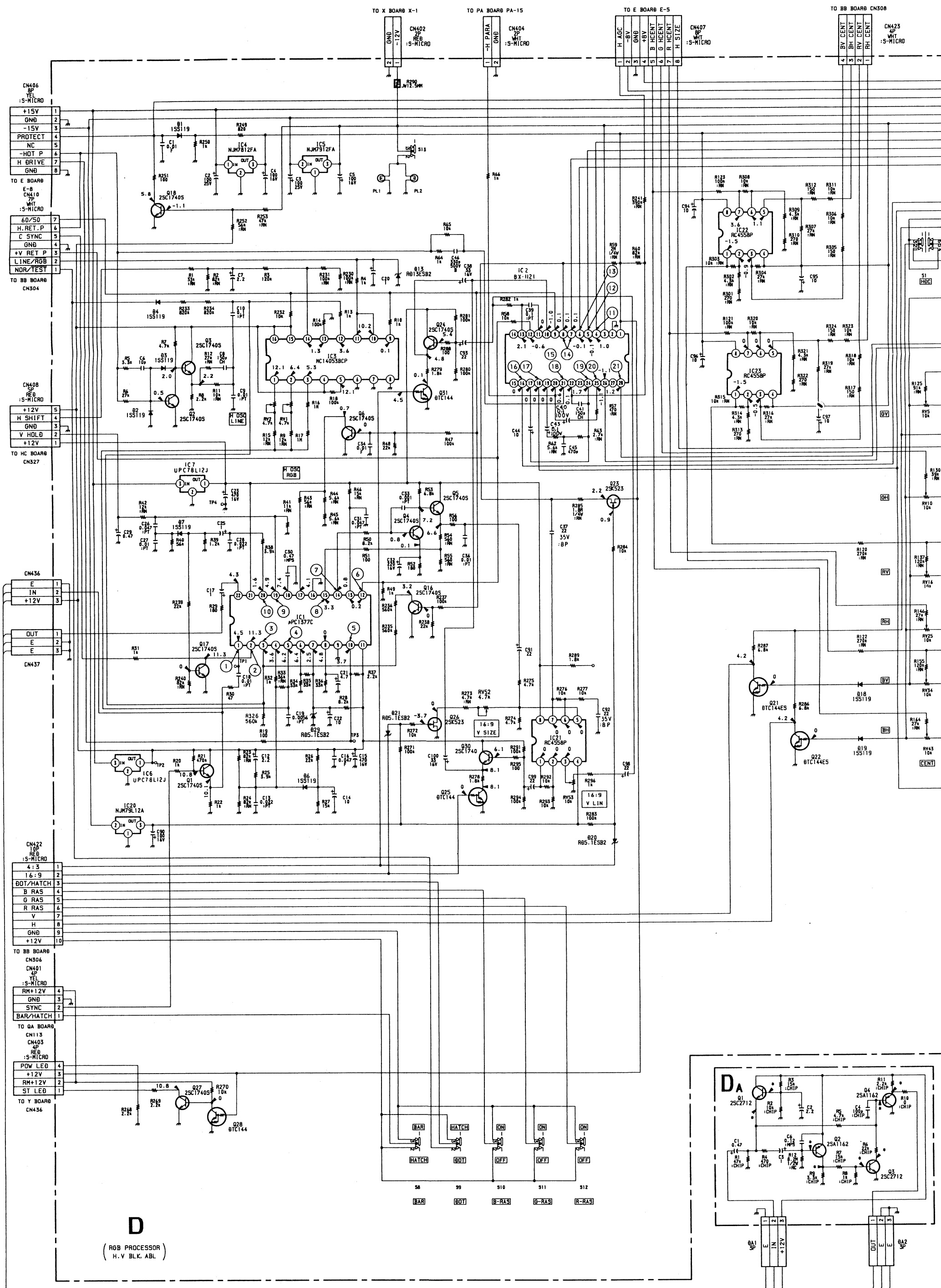


Ref. No.	OPERATION	Ref. No.	OPERATION
Q1	H · V OSC	Q17	V · BLK ADD
Q2	SIG GEN	Q18	-12V PROT
Q3	MODE SW	Q19	V · OUT PROT -1
Q4	+12V REG	Q20	V · OUT PROT -2
Q5	-12V REG	Q21	V · POLARITY SW
Q6	12V REG (H)	Q22	V · POLARITY SW
Q7	12V REG (V)	Q23	16:9 V · CENT SW
Q8	HALF H · V	Q24	V · PARA BUFF
Q9	TILT BUFF	Q25	16:9 V · SIZE SW
Q10	TILT SW	Q26	ST LED DRIVE
Q11	H LIN BUFF	Q27	LED SW
Q12	V KEYS BUFF	Q28	V · LIN BUFF
Q13	V · PIN AMP	Q30	V · LIN BUFF
Q14	V · PIN GEN	Q31	V · PARA SW
Q15	KEYS GEN		
Q16	+8V REG	D1	PROTECT
Q17	-8V REG	D2	H · PULSE CLIP
Q18	V AMP MAIN	D3	SPEED UP
Q19	V AMP R/B	D4	TEST H · CENT
Q20	-12V REG	D6	H · OSC · LIMIT
Q21	V · SAW AMP	D7	VD · SW
Q22	LEVEL SHIFT (B)	D8	HALF V · SW
Q23	LEVEL SHIFT (R)	D9	HALF H · SW
Q24	SYNC BUFF	D10	V · BIAS (G)
Q25	H · PULSE AMP	D11	V · BIAS (R)
Q26	V · PULSE BUFF	D12	V · BIAS (B)
Q27	V · SAW -1	D13	SW · PROT -13
Q28	V · SAW -2	D14	V · OUT PROT -1
Q29	V · SIZE 50/60 SW	D15	V · OUT PROT -2
Q30	V · DRIVE G	D16	V · OUT PROT -3
Q31	V · OUT (G) -1	D17	V · OUT PROT -4
Q32	V · OUT (G) -2	D18	STOPPER
Q33	V · DRIVE -R	D19	STOPPER
Q34	V · OUT (R) -1	D20	LEVEL SHIFT
Q35	V · OUT (R) -2	D21	LEVEL SHIFT
Q36	V · DRIVE -B	D22	PROTECTOR
Q37	V · OUT (B) -1	D23	PROTECTOR
Q38	V · OUT (B) -2	D24	HOLD DOWN REG
Q39	PAL · H · CENT		



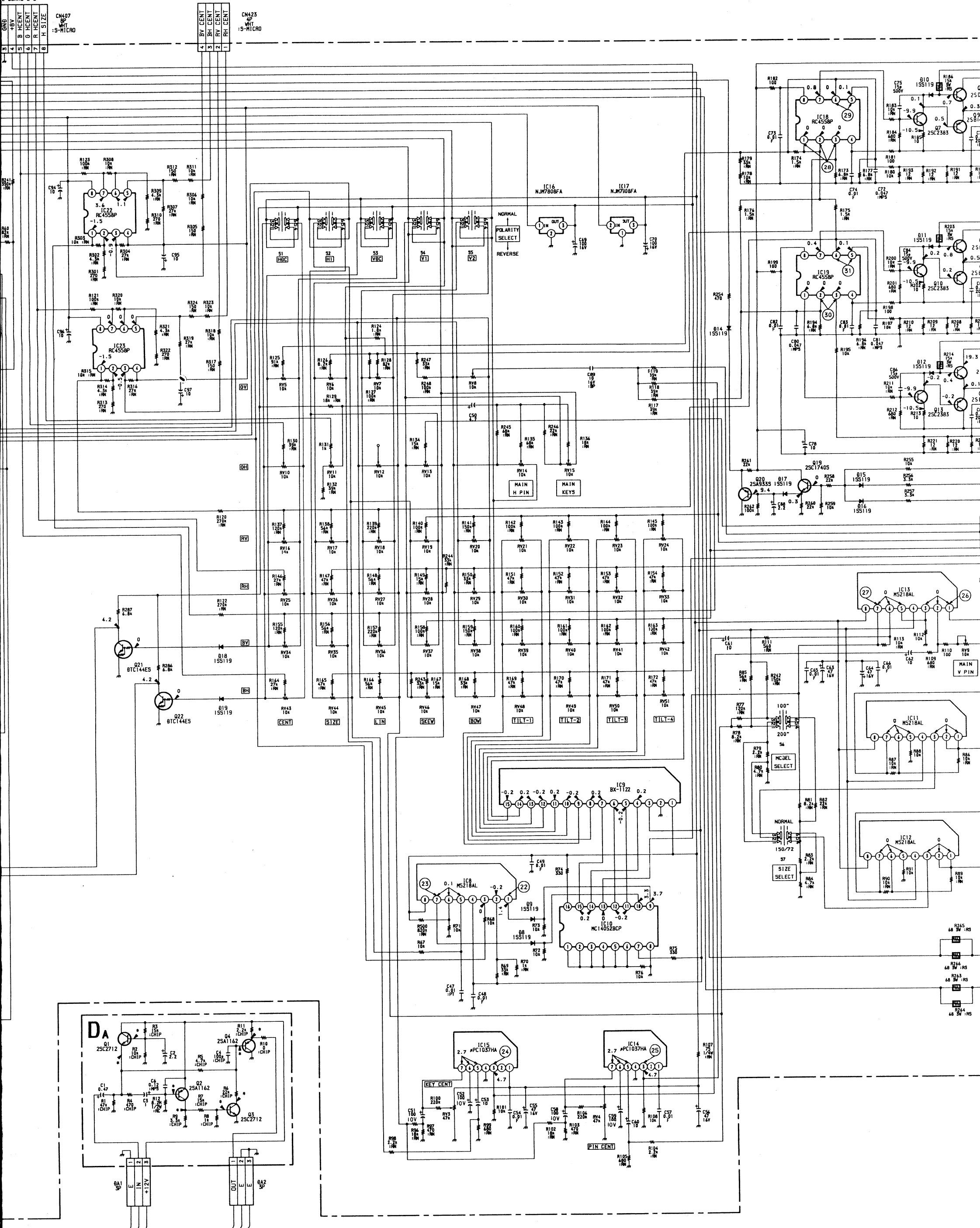
No.	OPERATION
Q1	V CLAMP
Q2	V SEP
Q3	VP SW
Q4	V BUFF

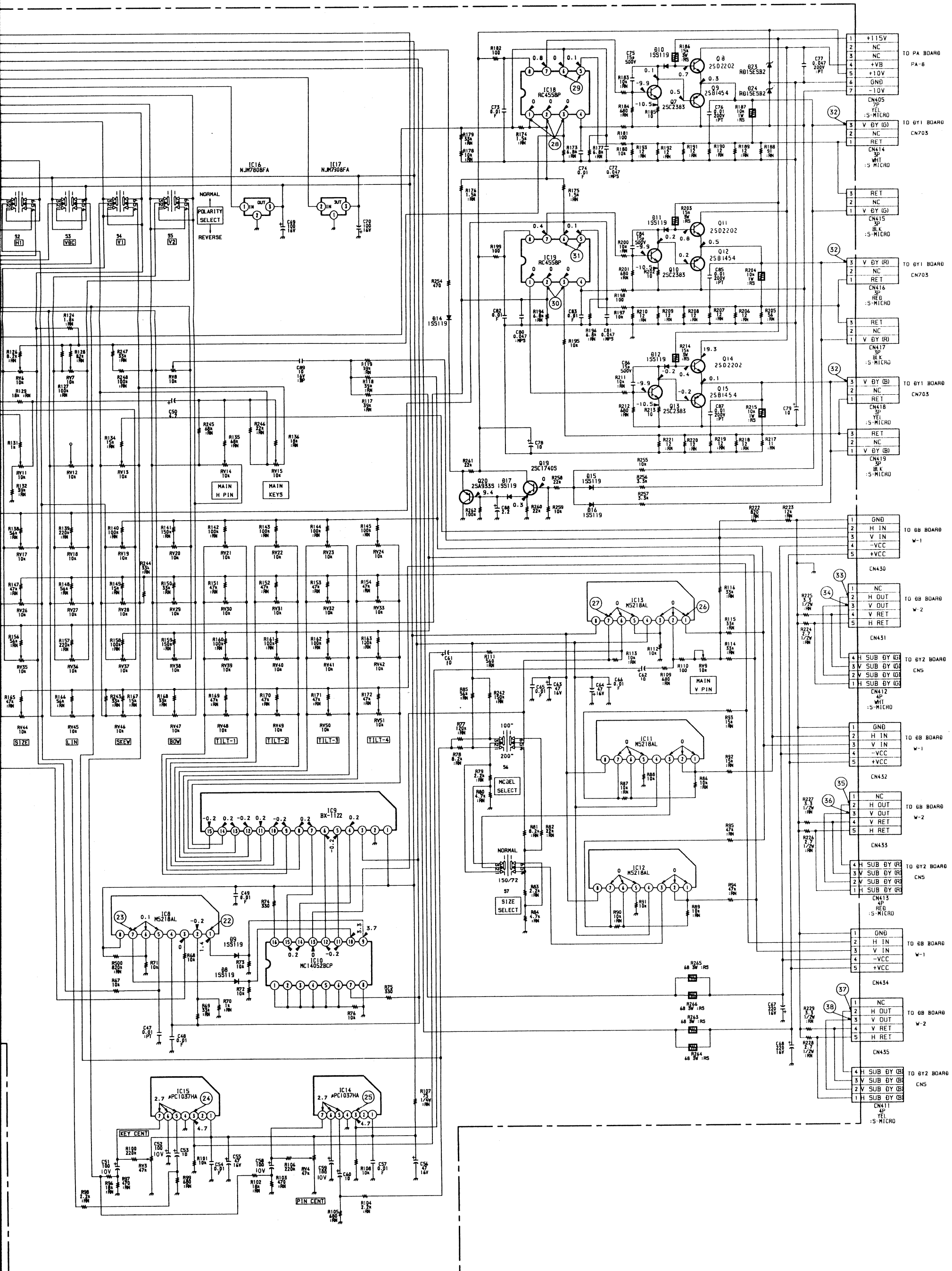
f. No.	OPERATION
IC1	SUB OUT DRIVE
Q1	V SUB OUT -1
Q2	V SUB OUT -2
Q3	H SUB OUT -1
Q4	H SUB OUT -2

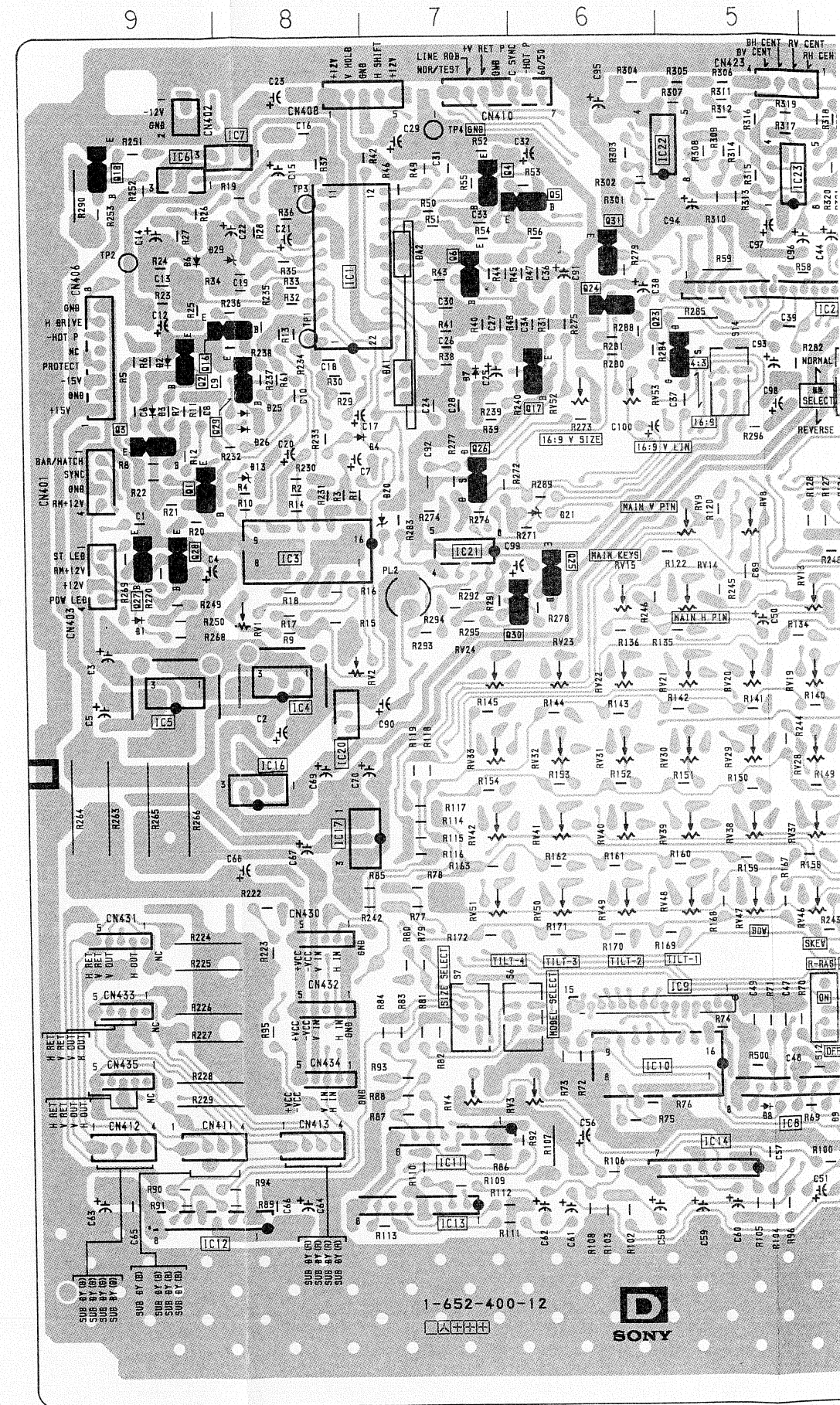
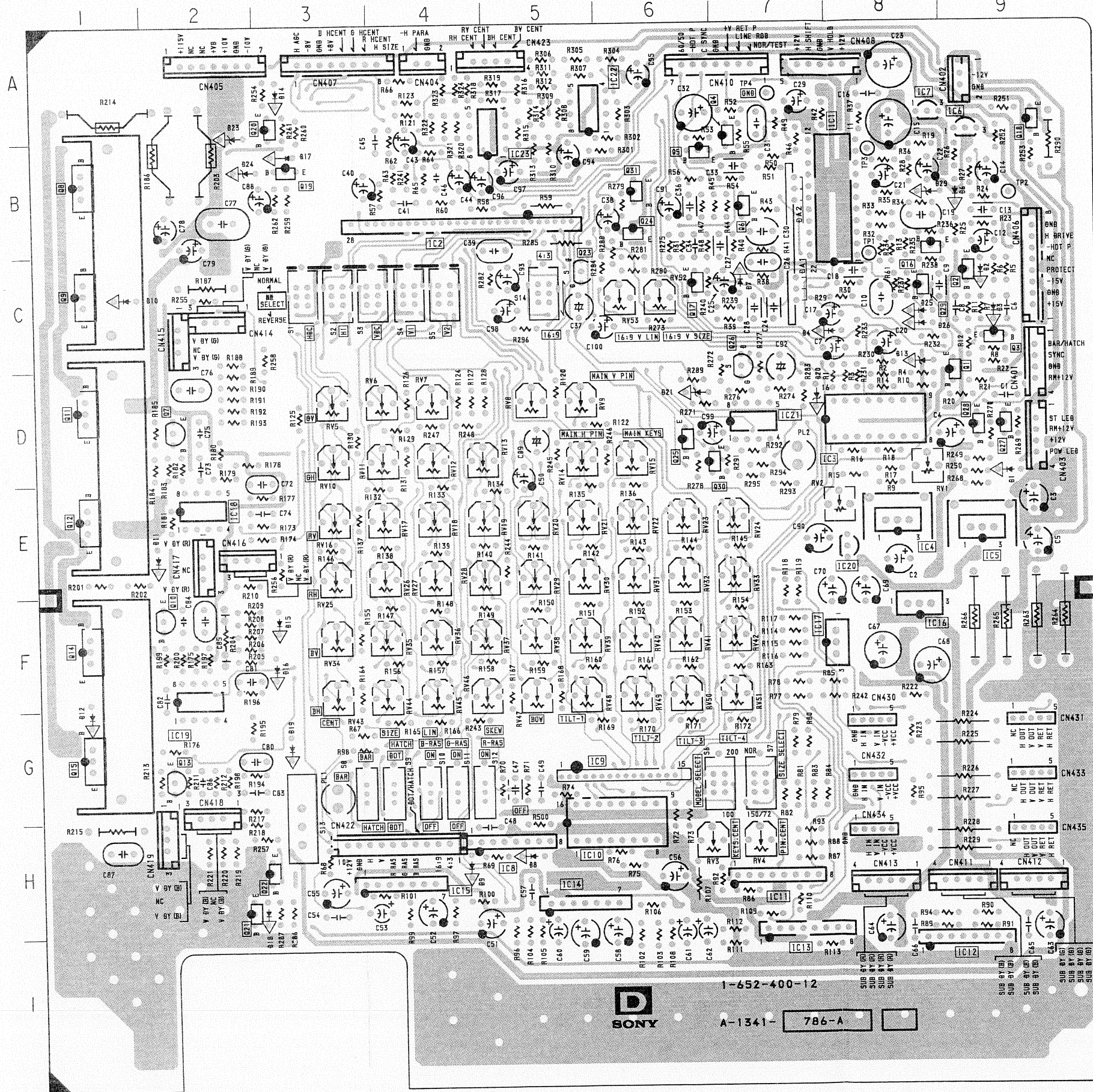


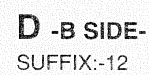
E BOARD E-5

TO BB BOARD CN308



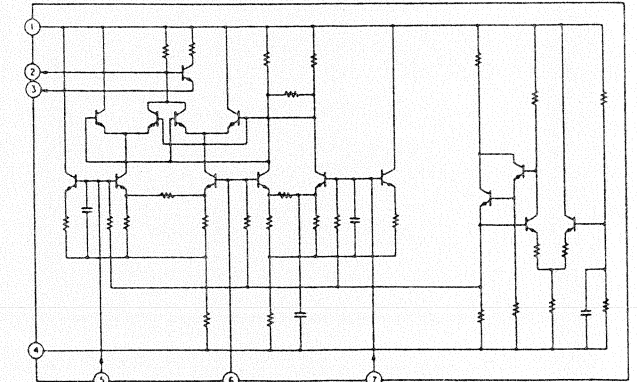
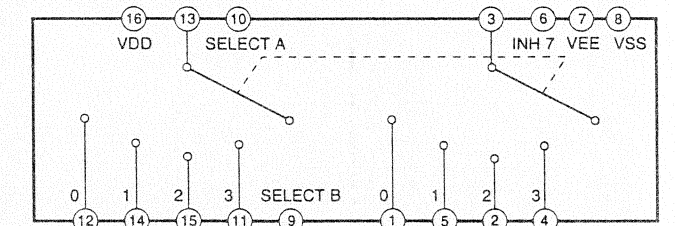
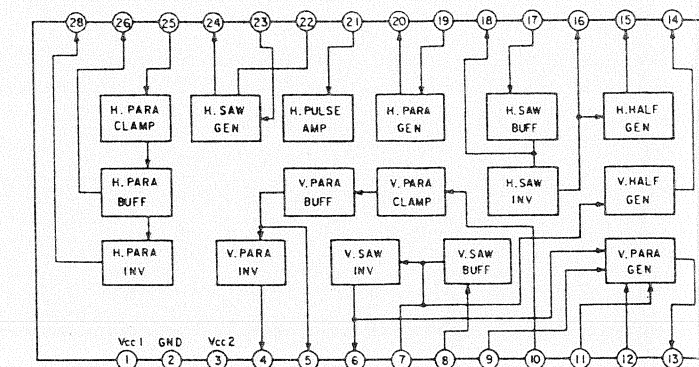
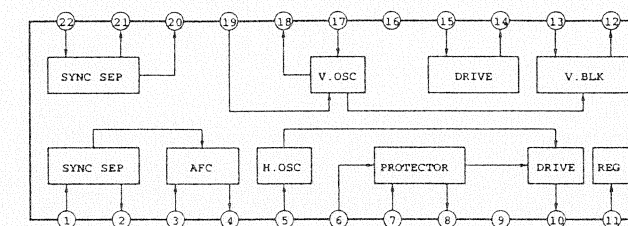




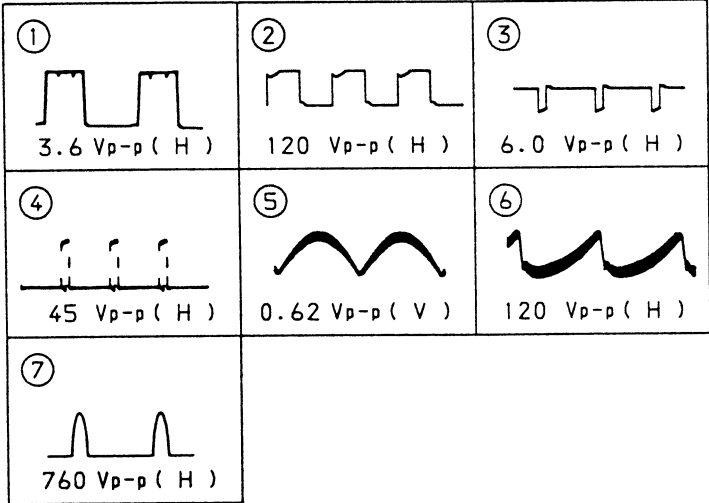


*: B SIDE

RV1	D-8
RV2	E-8
RV3	H-7
RV4	H-7
RV5	D-3
RV6	D-4
RV7	D-4
RV8	D-5
RV9	D-5
RV10	D-3
RV11	D-4
RV12	D-4
RV13	D-4
RV14	D-5
RV15	D-6
RV16	E-3
RV17	E-4
RV18	E-4
RV19	E-4
RV20	E-5
RV21	E-5
RV22	E-6
RV23	E-6
RV24	E-7
RV25	E-3
RV26	E-4
RV27	E-4
RV28	E-4
RV29	E-5
RV30	E-5
RV31	E-6
RV32	E-6
RV33	E-7
RV34	F-3
RV35	F-4
RV36	F-4
RV37	F-4
RV38	F-5
RV39	F-5
RV40	F-6
RV41	F-6
RV42	F-7
RV43	F-3
RV44	F-4
RV45	F-4
RV46	F-4
RV47	F-5
RV48	F-5
RV49	F-6
RV50	F-6
RV51	F-7
RV52	C-6
RV53	C-6
TP1	C-8
TP2	B-9
TP3	B-8
TP4	A-7



E BOARD WAVEFORMS



E BOARD OPERATION

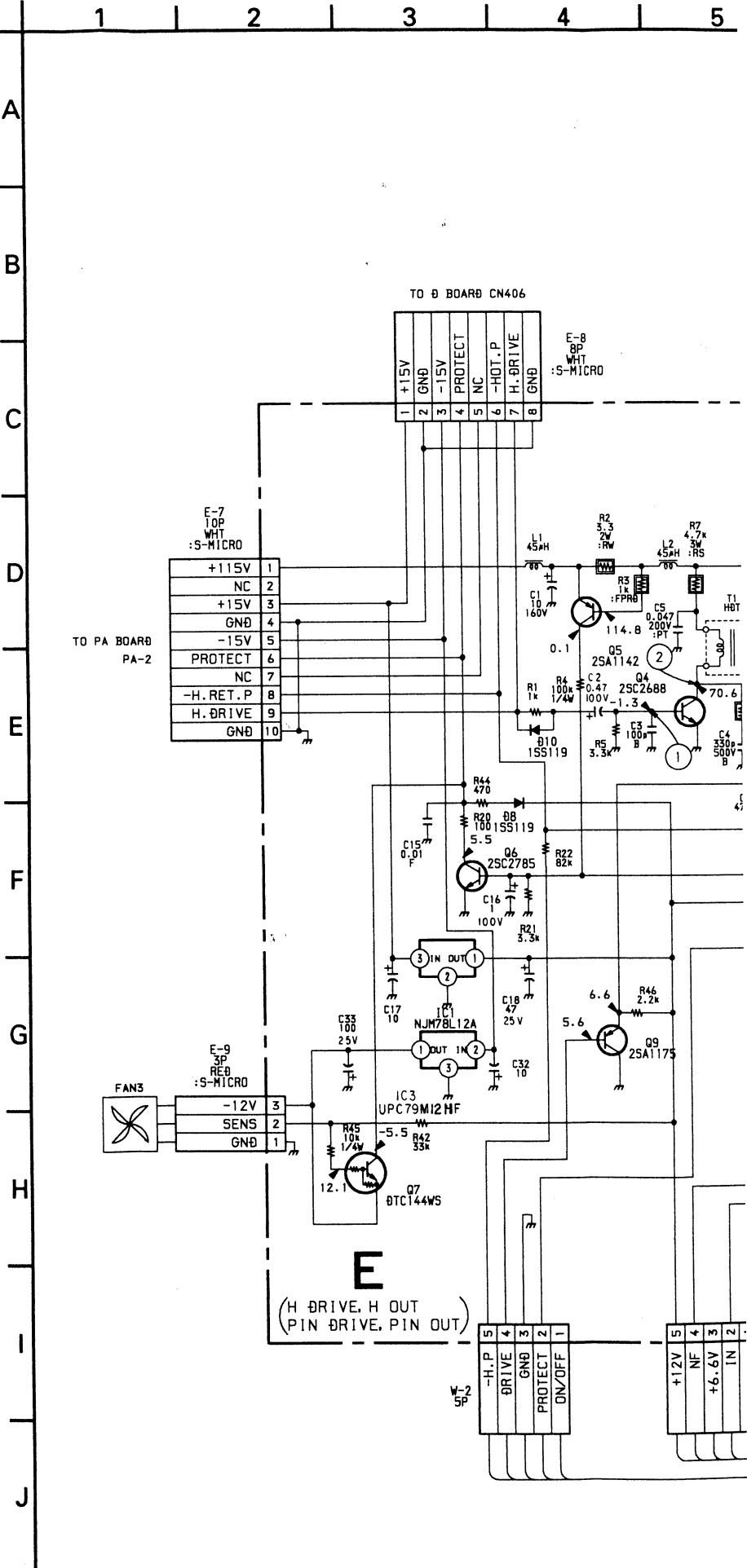
Ref. No.	OPERATION
IC1	12V REG
IC2	H • PIN AMP
IC3	+12V REG
Q1	H • OUT
Q2	H • PIN OUT
Q3	H • PIN DRIVE
Q4	H • OUT DRIVE
Q5	H • PIN OLD
Q6	PROTECT SW -1
Q7	PROTECT SW -2
Q9	H • PIN BUFF
D1	SPEED UP -1
D2	SPEED UP -2
D3	-100V CLAMP
D4	PULSE CLAMP
D6	6.8V ZENER
D7	H • PIN PROT -1
D8	12V REG PROT
D9	H • PIN PROT -2
D10	SPEED UP -3

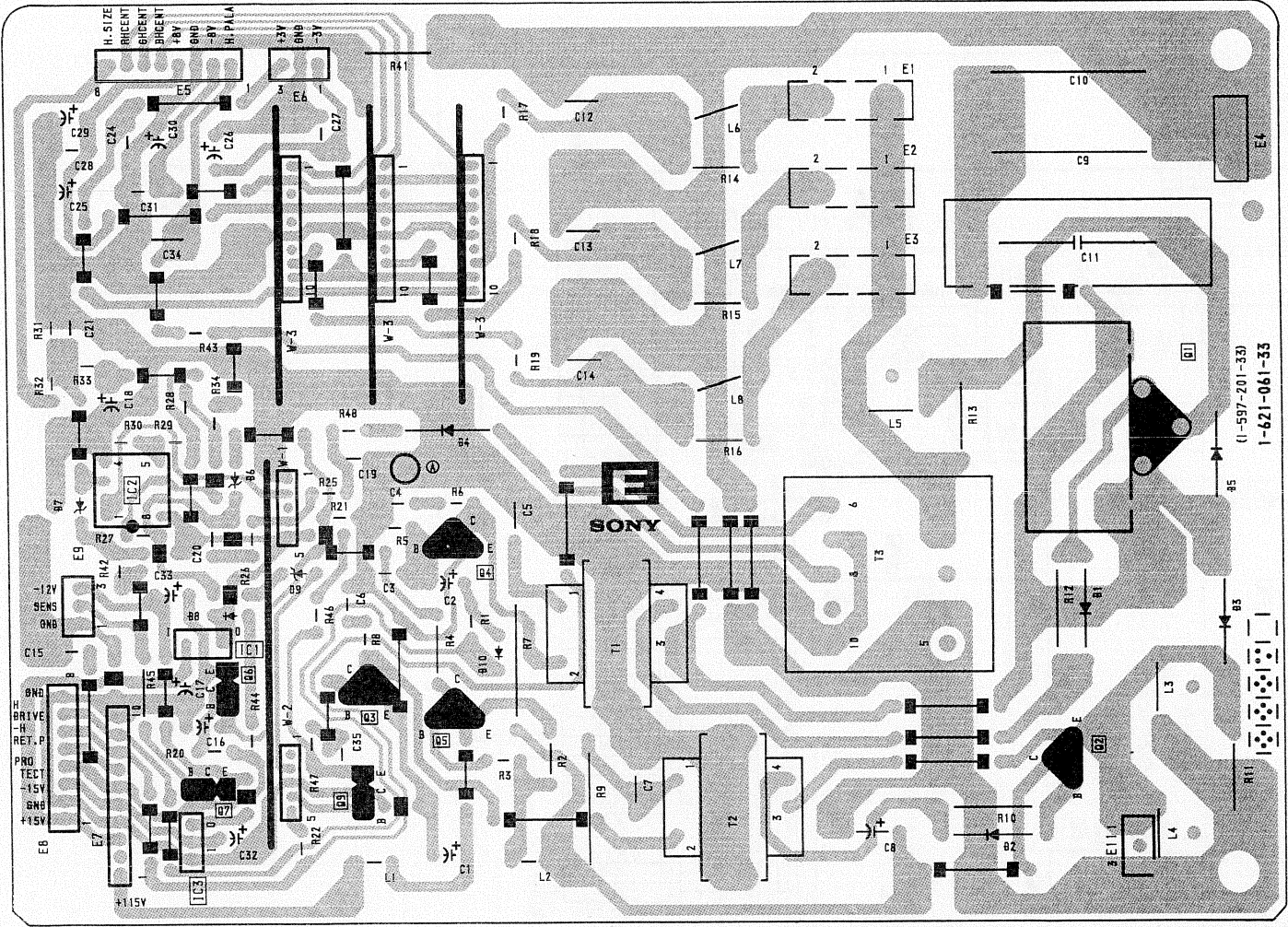
EB BOARD OPERATION

Ref. No.	OPERATION
IC1	H. PIN. CONT
D1	PROT

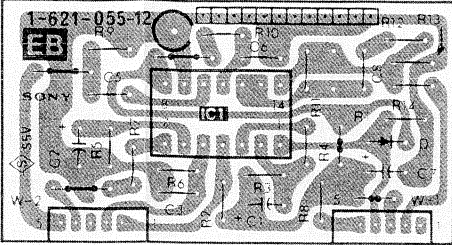
EC BOARD OPERATION

Ref. No.	OPERATION
IC1	H. CENT DRIVE
Q1	H. CENT. OUT -1
Q2	H. CENT. OUT -2

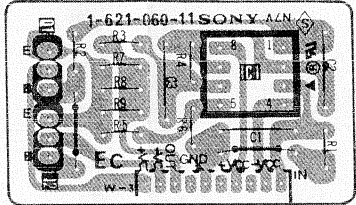




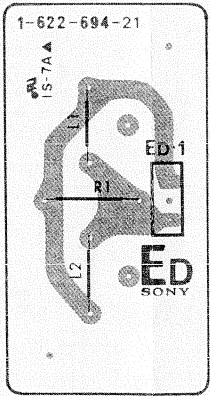
E
SUFFIX:-33



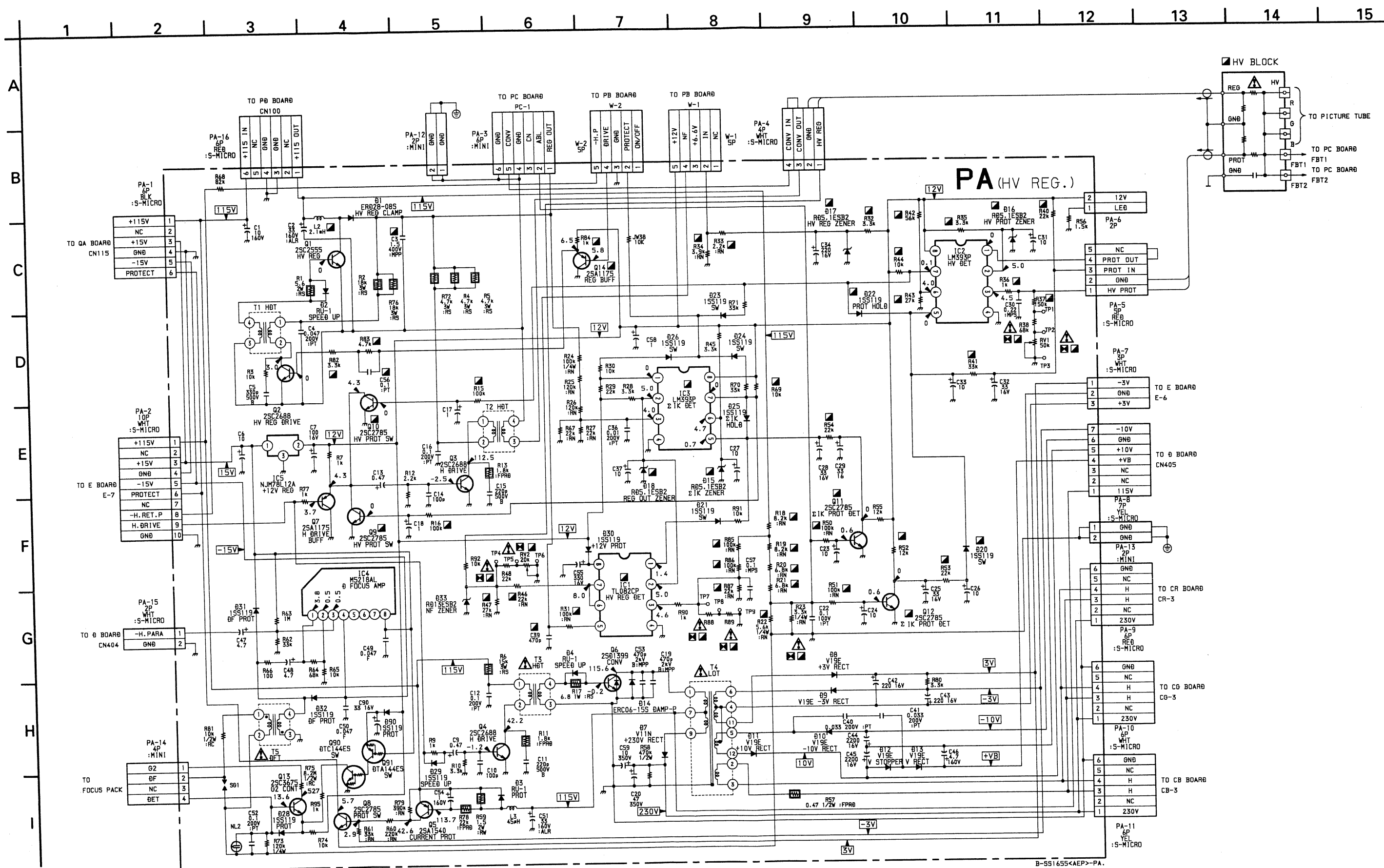
EB
SUFFIX:-12

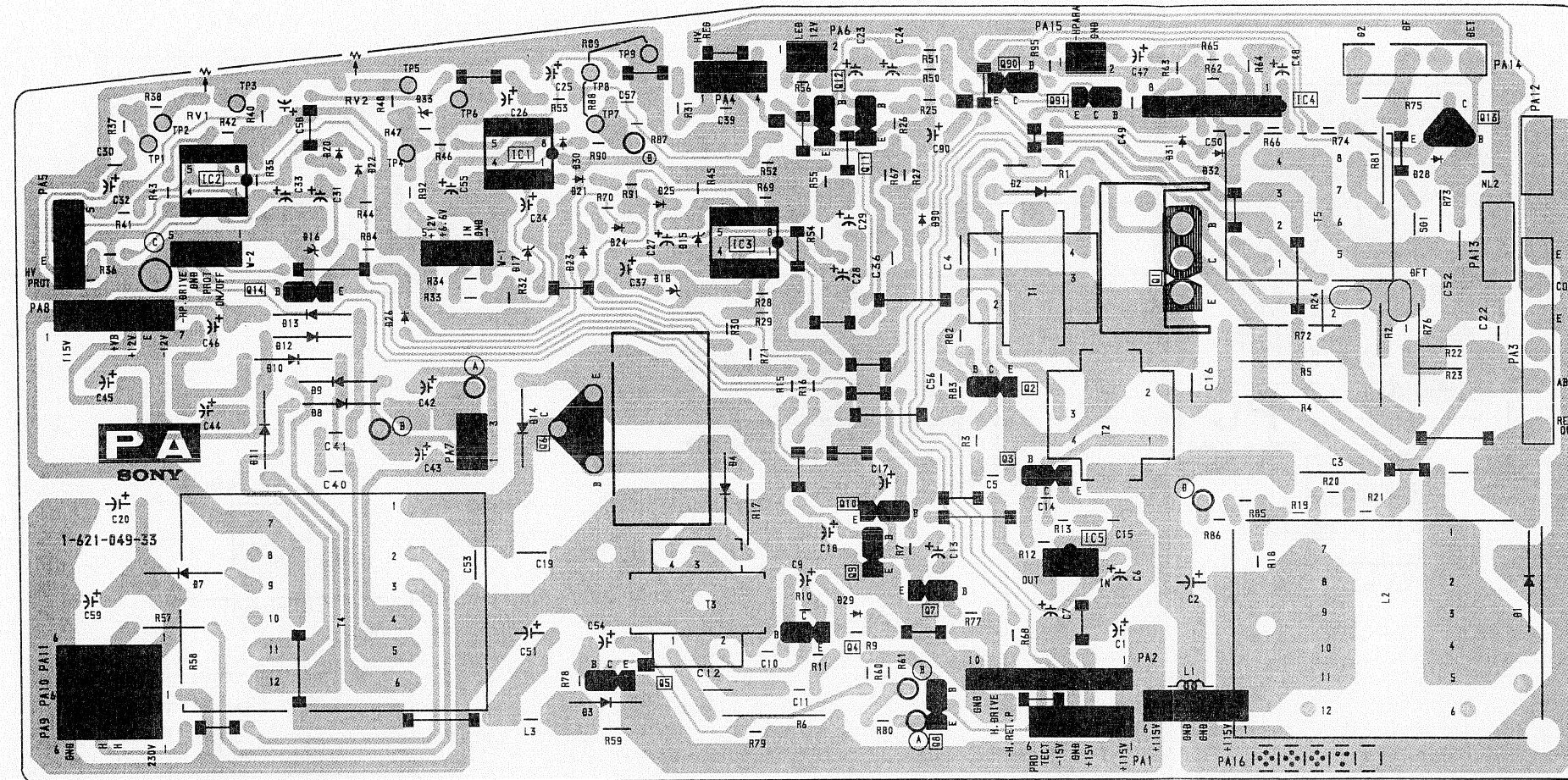


EC
SUFFIX:-11



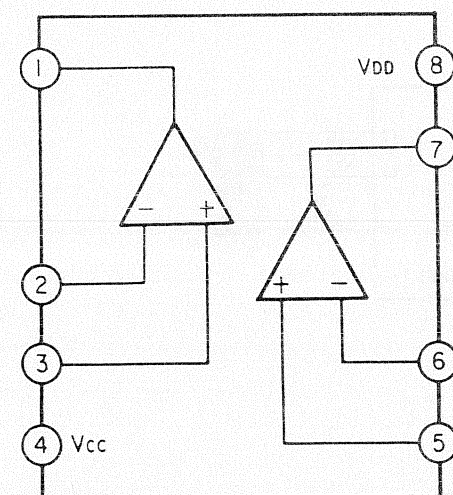
ED
SUFFIX:-21



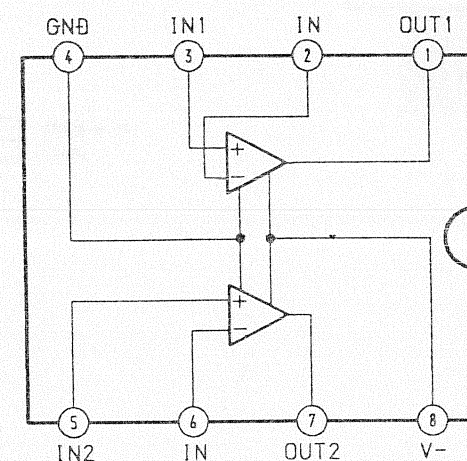


PA
SUFFIX:-33

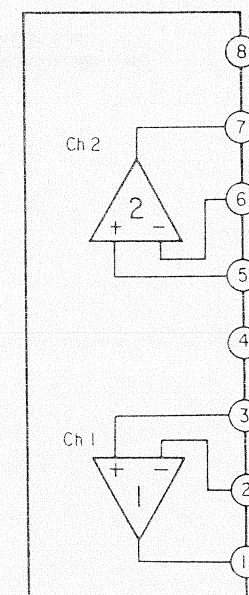
PA BOARD IC1 TL082CP

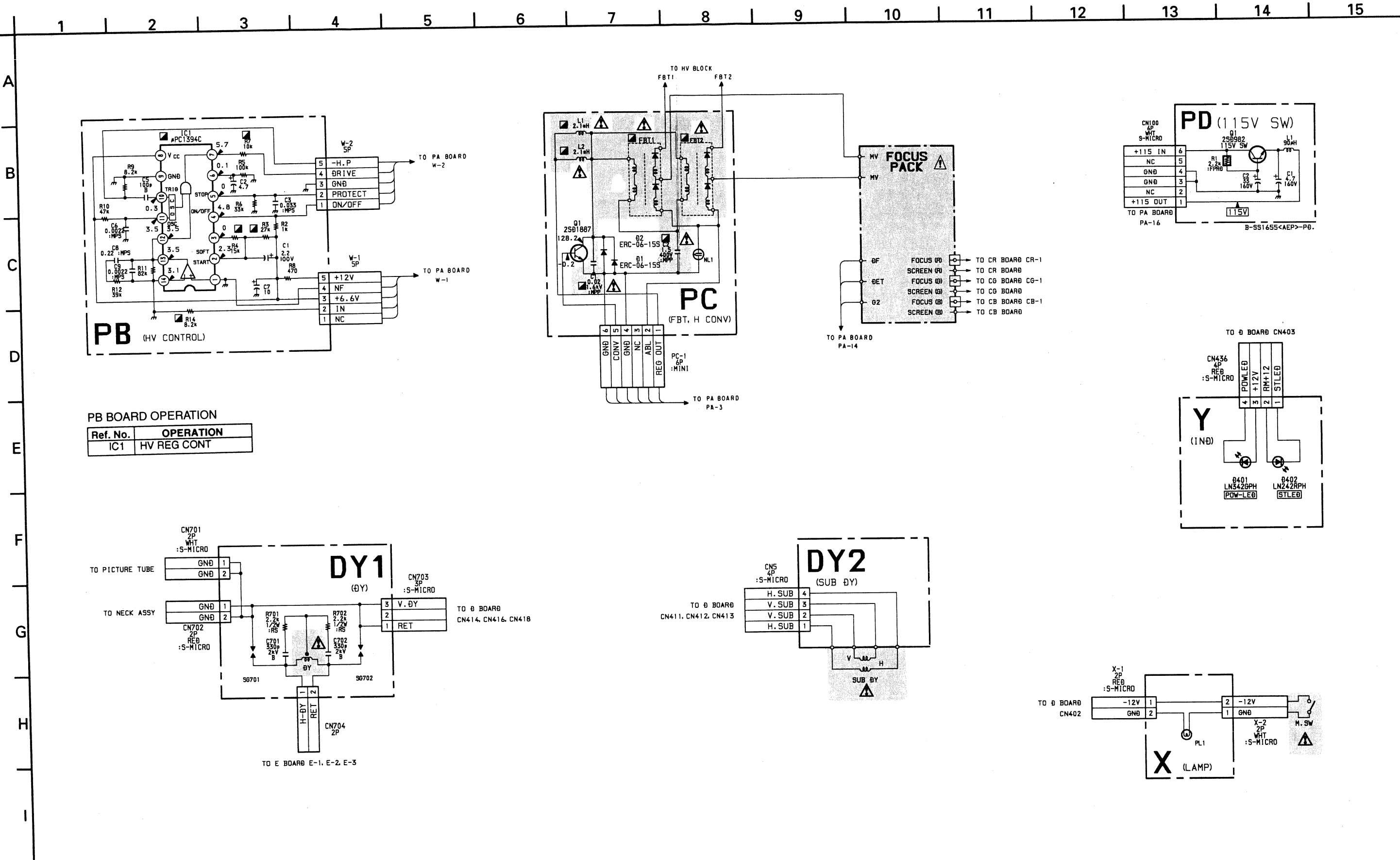


PA BOARD IC2,3 LM393P



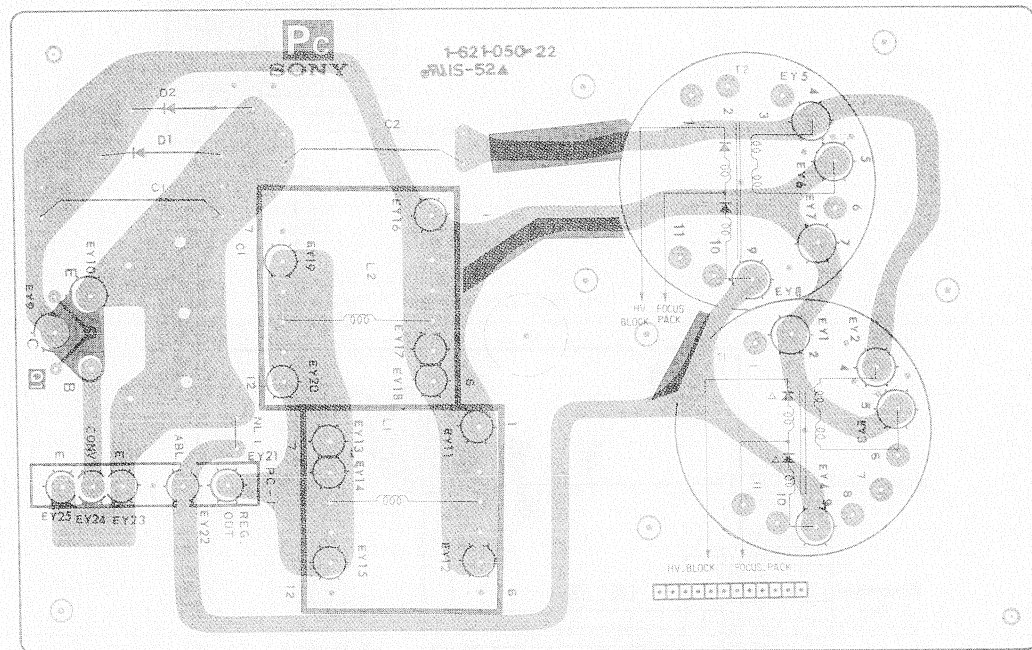
PA BOARD IC4 M5218AL



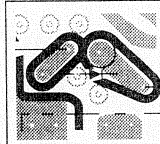


DY1, DY2, PB, PC, PD, X, Y

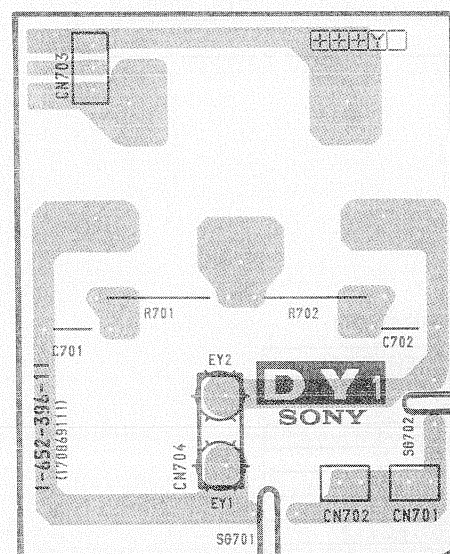
DY1, DY2, PB, PC, PD, X, Y



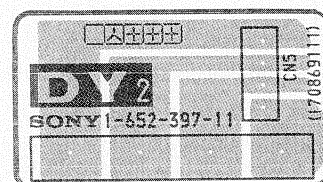
PC
SUFFIX:-22



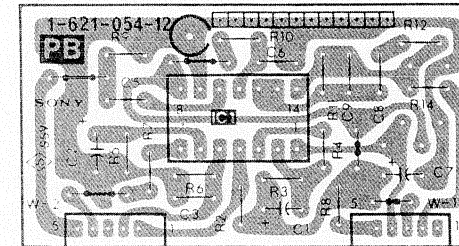
NOTE:
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.



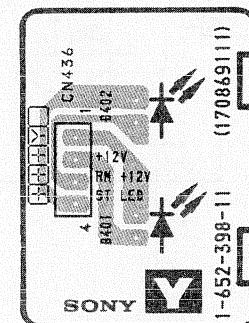
DY1
SUFFIX:-11



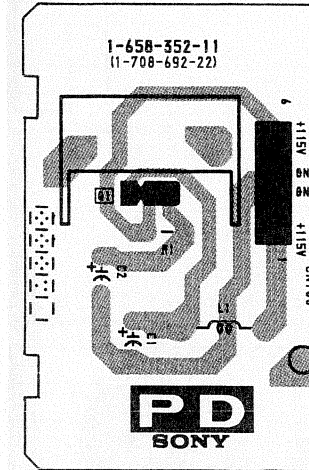
DY2
SUFFIX:-11



PB
SUFFIX:-12



Y
SUFFIX:-11



PD
SUFFIX:-11

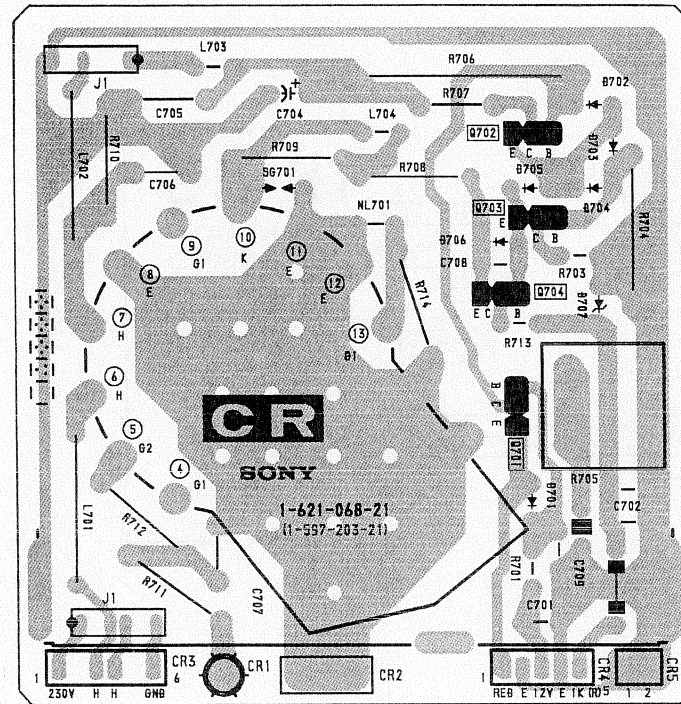


X
SUFFIX:-21

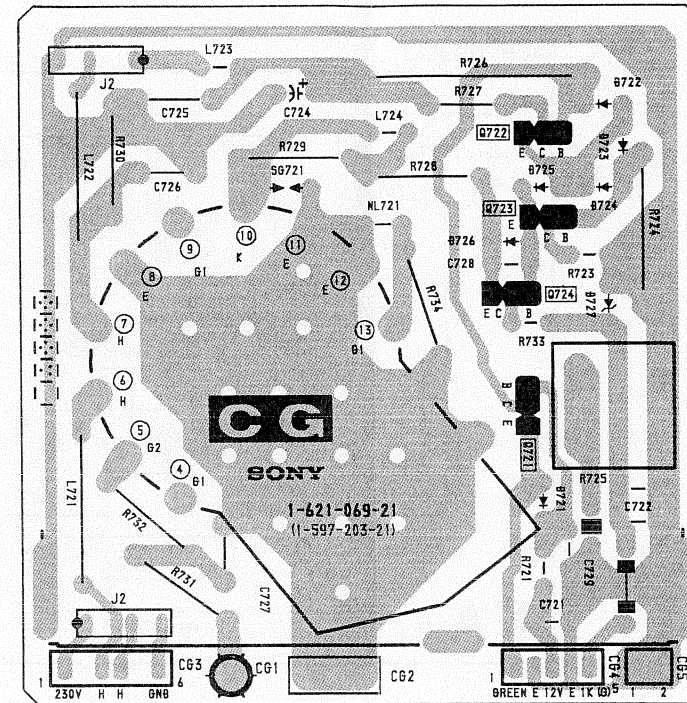
CG BOARD OPERATION

CR BOARD OPERATION

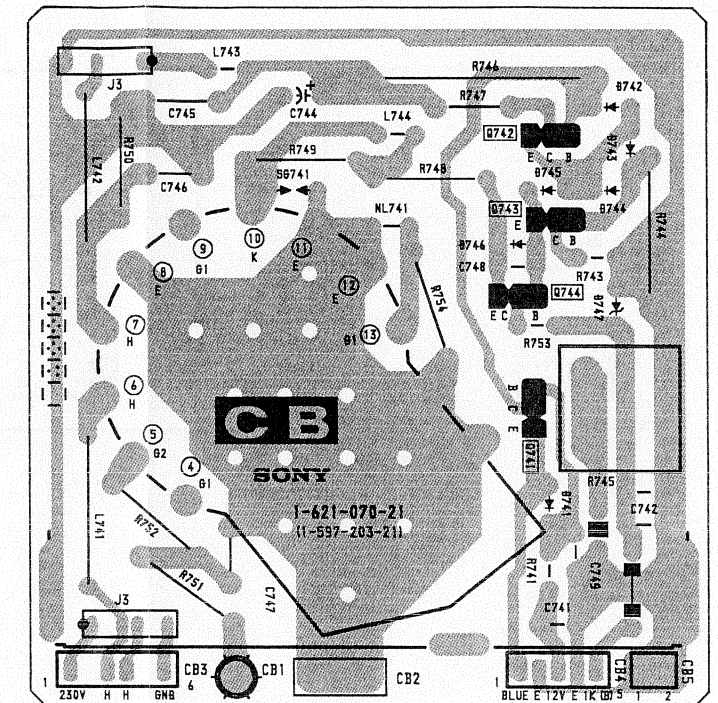
VPH-V20/V22



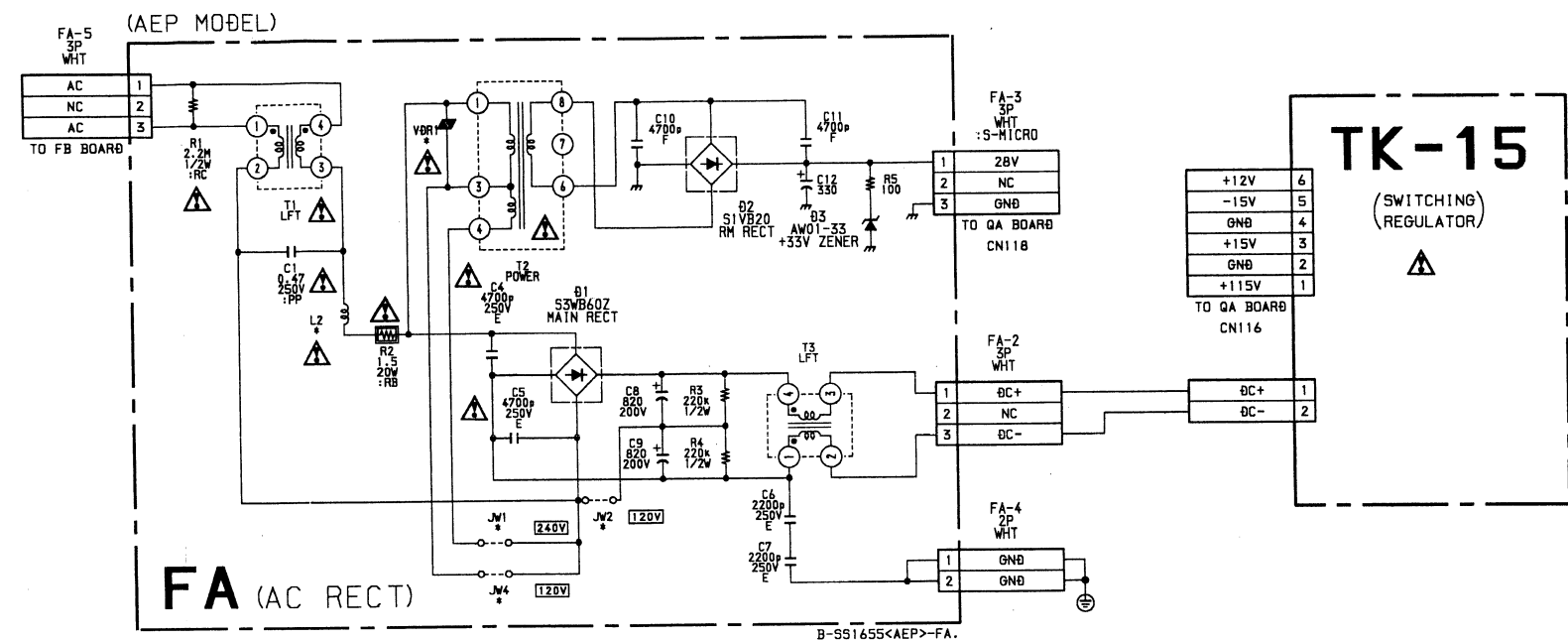
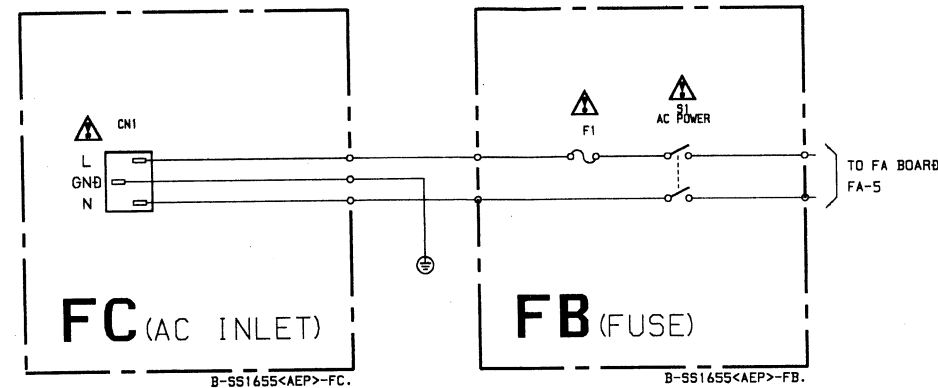
CR
SUFFIX:-21



CG
SUFFIX:-21



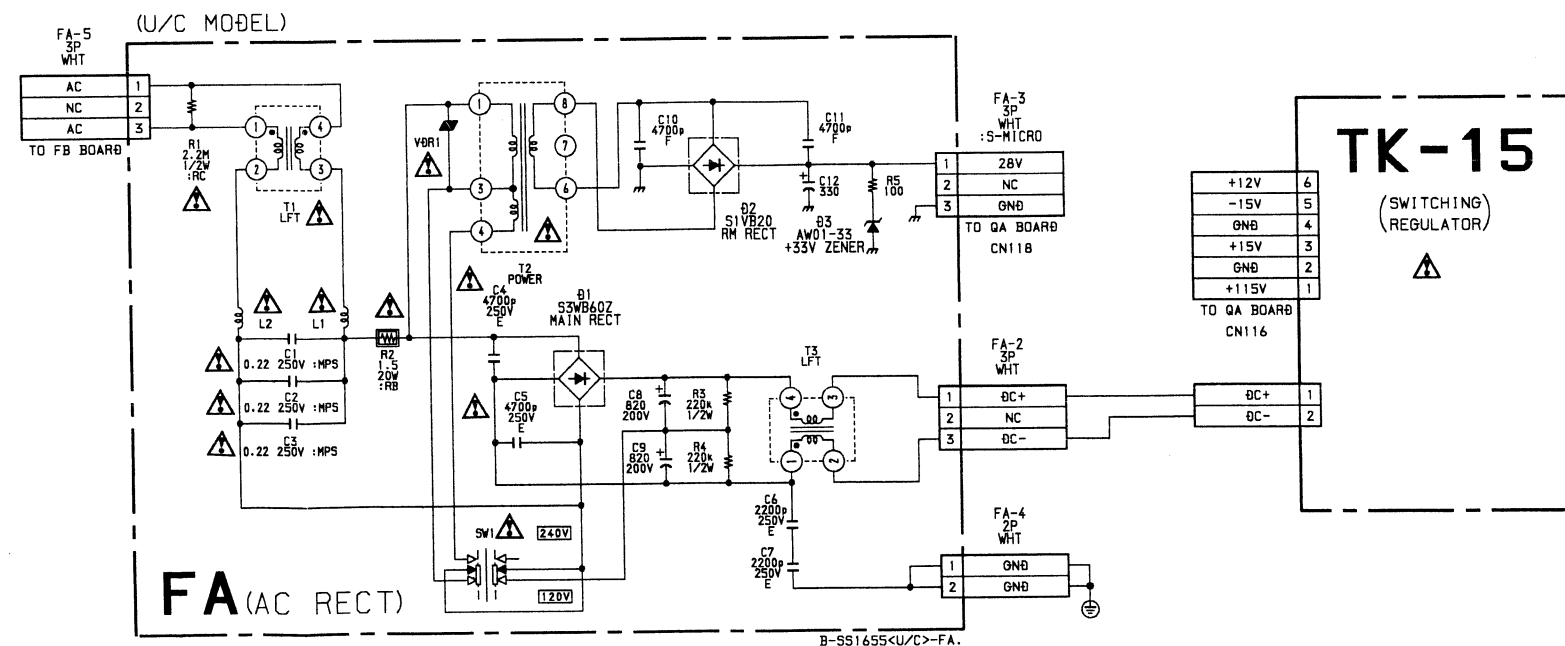
CB
SUFFIX:-21

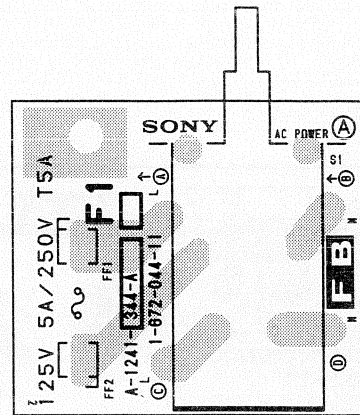


* MARK LIST

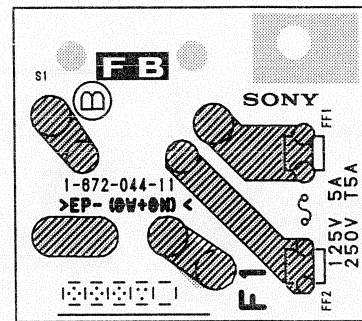
	AEP MODEL	J MODEL
JW1	10MM	#
JW2	#	7.5MM
JW4	#	7.5MM
L2	33mH	6.1mH
VDR1	#	AVR-G10D

#:not used



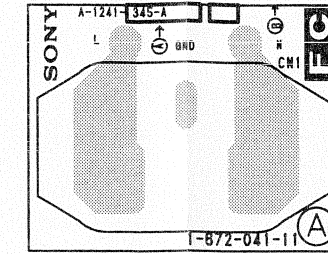


FB -A SIDE-
SUFFIX:-11

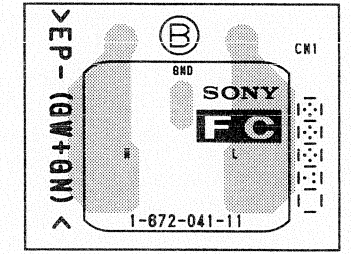


FB -B SIDE-
SUFFIX:-11

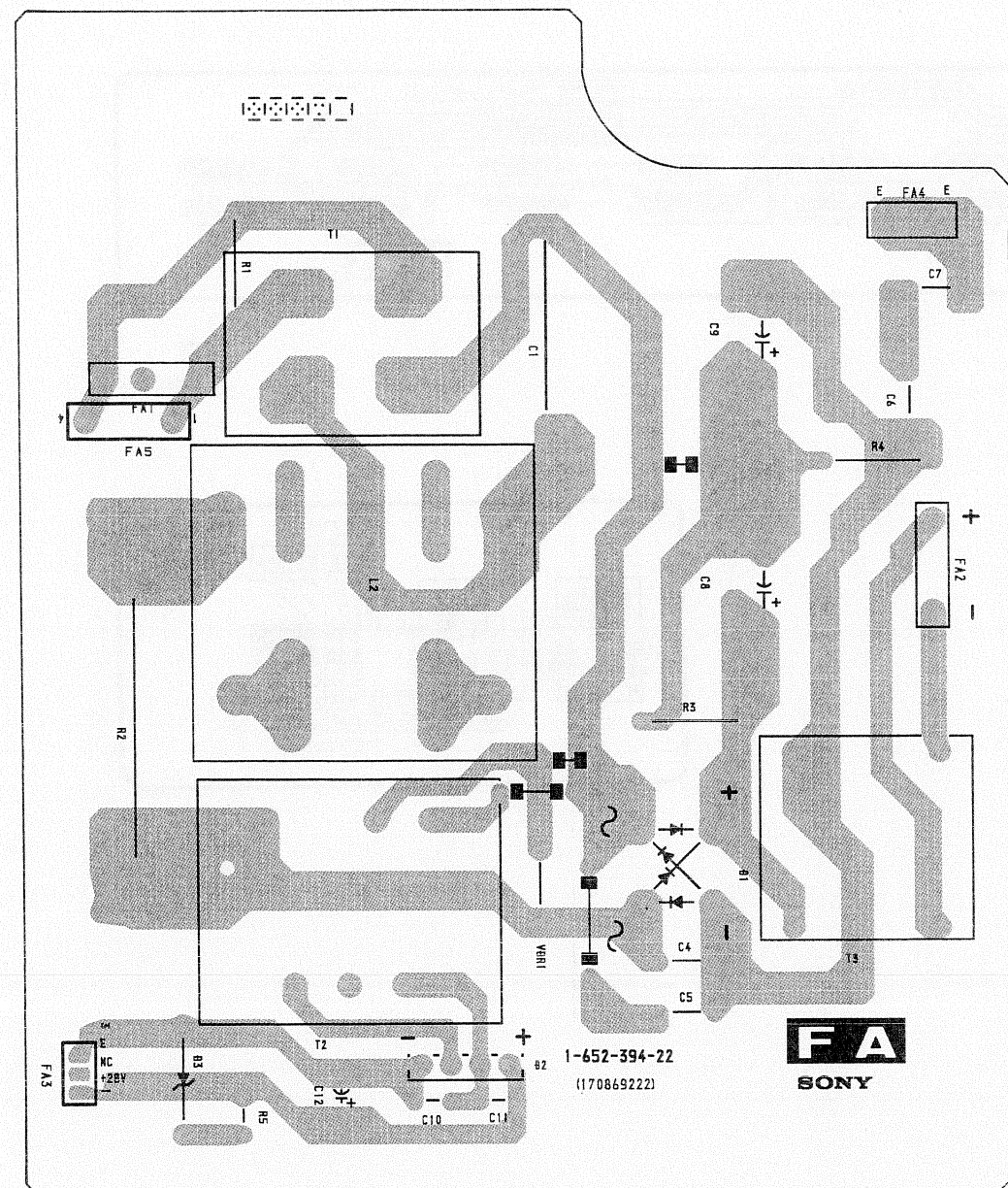
NOTE:
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.



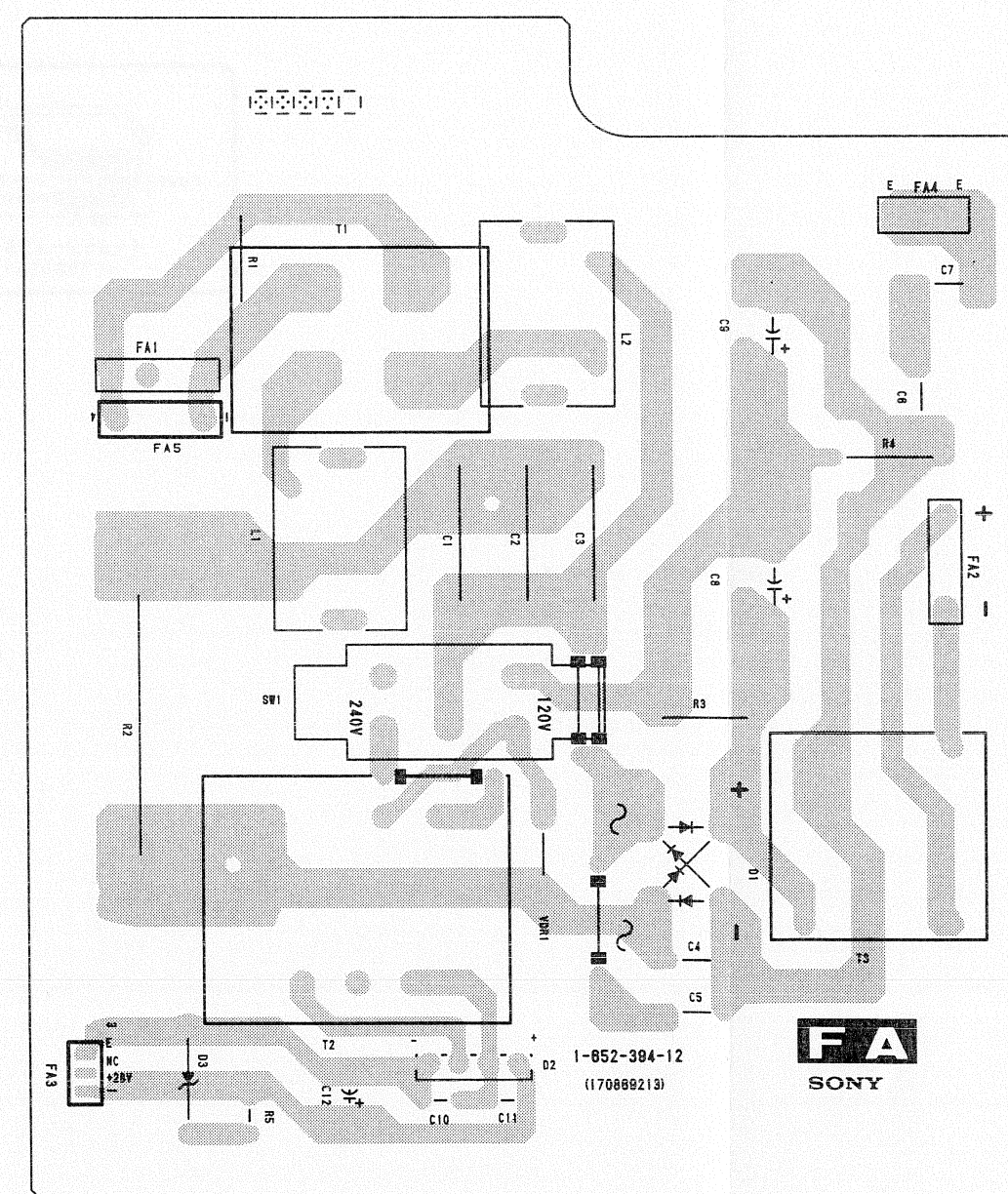
FC -A SIDE-
SUFFIX:-11



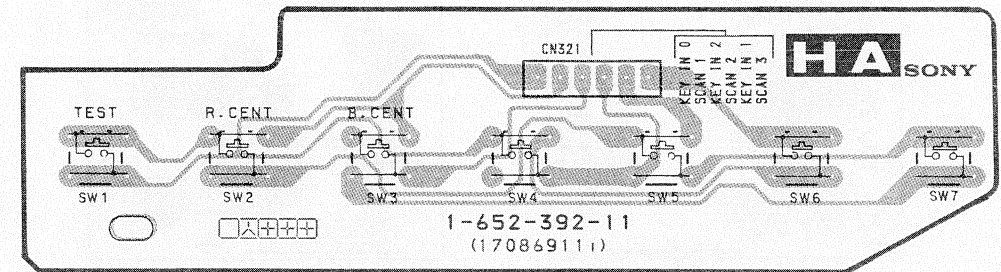
FC -B SIDE-
SUFFIX:-11



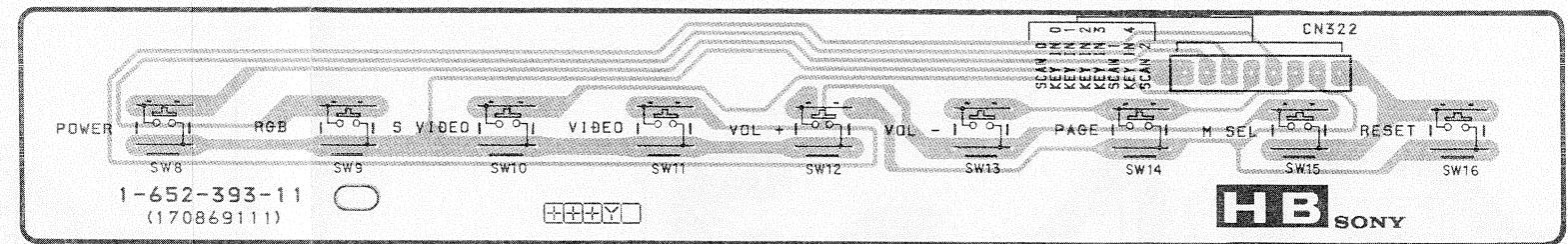
FA
SUFFIX:-22
VPH-V20M/V22M



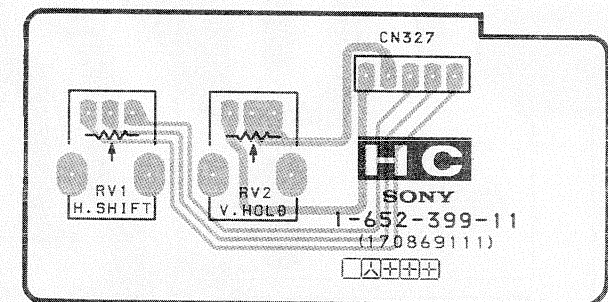
FA
SUFFIX:-12
VPH-V20U



HA
SUFFIX:-11



HB
SUFFIX:-11



HC
SUFFIX:-11

